

Product Name :
Expansion Processes of a Perfect Gas

Product Code :
ALABS-A175-001

ALTEC™

Description :

Expansion Processes of a Perfect Gas

- A small-scale unit designed to introduce students to the properties of a Perfect Gas using air to demonstrate basic thermodynamic processes.
- The hardware consists of two floor-standing interconnected rigid vessels, one equipped for operation under pressure and the second under vacuum.
- Appropriate valves and tappings are fitted to allow different thermodynamic processes to be evaluated. An electric air pump is supplied to allow pressurisation or evacuation of the vessels as required for the different exercises. Each vessel incorporates a fast response thermistor sensor to monitor the temperature of the air and connection to a piezo electric pressure sensor.
- All power supplies, signal conditioning circuitry etc are contained in a simple electrical console with appropriate current protection devices and an RCD for operator protection. Readings from the pressure sensors and thermistors are

displayed on a common digital meter with selector switch and corresponding signals are routed to an I/O port for connection to a PC using an optional interface device/educational software package or a user supplied chart recorder as required.

- A comprehensive instruction booklet describing how to carry out the laboratory teaching exercises is included.

Key Features:

- Interconnected vessels operating under pressure and under vacuum are supplied complete with electric air pump and appropriate instrumentation ready for use.
- This modern version of a classic experiment (attributed to Clément and Désormes) allows pressure and temperature changes to be monitored continuously using a PC. (optional teaching software available)
- The vessels can be operated singly or in combination allowing processes whereby air flows from a pressurised vessel to atmosphere, from atmosphere to an evacuated vessel or from a pressurised vessel to an evacuated vessel.

Description:

The apparatus consists of two floor-standing interconnected rigid vessels, one equipped for operation under pressure and the second under vacuum. An electrically operated air pump mounted on top of the vessels, together with valves and tapings allows the appropriate vessel to be pressurised or evacuated as required to suit the teaching exercise. The vessels can be used independently or together to allow different thermodynamic processes to be evaluated. A pressure sensor connected to each vessel and a temperature sensor inside each vessel allow the changes in the properties of the air contained within the vessels to be monitored continuously. Both vessels are constructed from clear rigid plastic which affords light insulation between the air inside the vessel and the surroundings to reduce heating/cooling but allows each vessel and its contents to return to ambient temperature reasonably quickly. The capacity of the pressurised vessel is approximately 23 litres. The capacity of the evacuated vessel is approximately 11 litres



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