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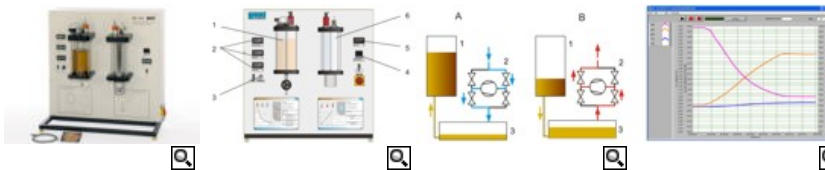
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Fluid Mechanics

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Overviews

Products | Thermal Engineering and HVAC | Fundamentals of Thermodynamics | [WL 102](#)**WL 102** Change of State of Gases**Technical Description**

Gas laws belong to the fundamentals of thermodynamics and are dealt with in every training course on thermodynamics.

The WL 102 unit enables two changes of state to be studied experimentally: isothermic change of state, also known as the Boyle-Mariotte law, and isochoric change of state, which occurs at constant volumes. Transparent tanks enable the change of state to be observed. **Air is used as test gas.**

In the first tank, positioned on the left, the enclosed air volume is reduced or increased using a compressor and hydraulic oil. This results in an isothermic change of state. **The compressor can also operate as a vacuum pump. If the changes occur slowly, the change of state takes place at an almost constant temperature.**

In the second tank, positioned on the right, the temperature of the test gas is increased by a controlled electric heater and the resulting pressure rise is measured. **The volume of the enclosed gas remains constant. Temperatures, pressures and volumes are measured electronically, digitally displayed and transferred to a PC for processing.**

The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Specification

- [1] experimental investigation of gas laws
- [2] transparent measuring tank 1 for investigation of isothermic change of state
- [3] **hydraulic oil filling for changing volume of test gas**
- [4] built-in compressor ensures necessary pressure differences to move the oil volume
- [5] compressor can also be used as vacuum pump
- [6] **5/2-way valve for switching between compression and expansion**
- [7] transparent measuring tank 2 for investigation of isochoric change of state
- [8] **electrical heater with temperature control in tank 2**
- [9] sensors and digital displays for temperatures, pressures and volumes
- [10] GUNT software for data acquisition via USB under Windows Vista or Windows 7

Technical Data

Compressor / vacuum pump
 - power output: 60W
 - delivery side: 2bar
 - intake side: 213mbar
 Temperature controller: PID, 300W, limited to 80°C

Measuring ranges
 Temperature
 - tank 1: 0...80°C
 - tank 2: 0...80°C
 Pressure
 - tank 1: 0...4bar absolute
 - tank 2: 0...2bar absolute
 Volume
 - tank 1: 0...3L

Dimensions and Weight

LxWxH: 900x550x900mm
 Weight: approx. 50kg

Required for Operation

230V, 50/60Hz, 1 phase or 120V, 60Hz/CSA,
 1 phase

Scope of Delivery

- 1 experimental unit
- 1 GUNT software CD + USB cable
- 1 bottle with hydraulic oil
- 1 feed hopper
- 1 set of instructional material

Order Details

060.10200 WL 102 Change of State of Gases

Learning Objectives / Experiments

- demonstrating the laws of state changes in gases experimentally
- isothermic change of state, Boyle-Mariotte Law
- Isochoric change of state, Gay-Lussac's 2nd Law

Features

- * Isothermic and isochoric change of state of air
- * GUNT software for acquisition, processing and display of measured data

Available accessories

[WP 300.09 -- Laboratory Trolley](#)

