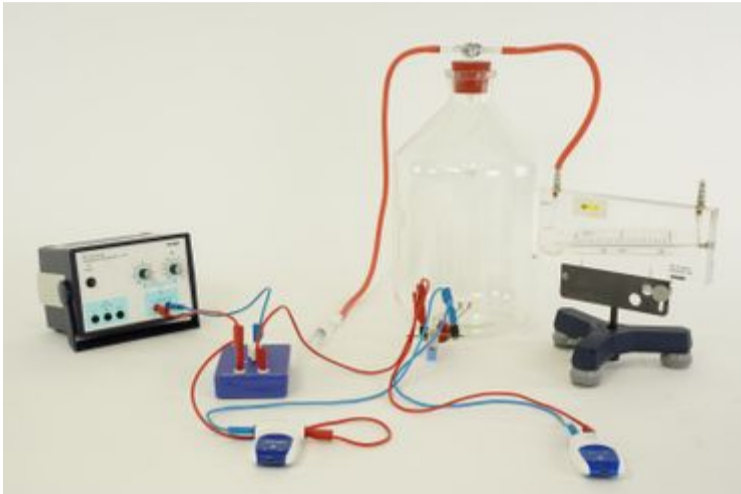


## Heat capacity of gases with Cobra SMARTsense

Article no: P2320267



### Principle

Heat is added to a gas in a glass vessel by an electric heater which is switched on briefly. The temperature increase results in a pressure increase, which is measured with a manometer. Under isobaric conditions a temperature increase results in a volume dilatation, which can be read from a gas syringe. The molar heat capacities are calculated from the pressure or volume change.

### Benefits

- Determination of  $c_p$  and  $c_v$
- For both demonstration and student experiments
- Suitable for many different gases
- Simplified implementation: all pre-settings already prepared

### Tasks

Determine the molar heat capacities of air at constant volume and at constant pressure.

### Learning objectives

- Equation of state for ideal gases
- 1st law of thermodynamics
- Universal gas constant
- Degree of freedom
- Mole volumes
- Isobars
- Isotherms
- Isochors and adiabatic changes of state

Software included. Computer not provided.

## Scope of delivery

Cobra SMARTsense Voltage - Sensor for measuring electrical voltage $\pm 30$ V (Bluetooth + USB)	12901-01	1
Cobra SMARTsense Current - Sensor for measuring electrical current $\pm 1$ A (Bluetooth + USB)	12902-01	1
measureLAB, multi-user license	14580-61	1

Precision manometer	03091-00	1
Weather monitor, 6 lines LCD	87997-10	1
PHYWE Power supply, 230 V, DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A	13506-93	1
Syringe 10ml, Luer, 100 pcs	02590-10	1
Stopcock,1-way,straight, glass	36705-00	1
Stopcock,3-way,t-sh.,capil.,glass	36732-00	1
Rubber stopper 26/32, 3 holes, 1 x 7 mm + 2 x 1,5 mm	39258-14	1
Rub.stop.d=59.5/50.5mm, 1 hole	39268-01	1
Rubber hose	39282-00	2
Silicone tubing, inner diameter 3 mm	39292-00	1
Tubing adaptor, ID 3-5/6-10 mm	47517-01	1
Nickel electrode,d 3mm,w.socket	45231-00	2
Chrome-nickel wire, d.0,1mm,100m	06109-00	1
Scissors,straight,blunt,l 140mm	64625-00	1