

Transformation of energy***Transformation of mechanical energy into thermal energy***

Conservation of energy during the compression of air -
Measurement with Sensor-CASSY and CASSY-Display

Object of the experiment

1. Measuring the increase in temperature in a gas syringe when the enclosed air is compressed quickly

Setup**Measuring example**

Temperature T_0 in K	Temperature T_1 in K	Temperature difference ΔT in K
296.4	305	8.6 K

Evaluation

When the air enclosed in a gas syringe is compressed quickly, its temperature increases.

The mechanical energy transferred via muscle power is transformed into thermal energy of the air.

Preparing the gas syringe:

- Attach the GL screw joints to the gas syringe and to the thermocouple.
- Fasten the glass connector firmly to the gas syringe.
- Draw the piston out until it reaches the 100 ml mark.
- Screw the thermocouple onto the glass connector.

Preparing the temperature measurement:

- Put the CASSY-Display into operation with the Sensor-CASSY being connected.
- Connect the temperature box to Input A, and plug in the thermocouple.
- Switch the display of Input B off with the key NEXT (CASSY) at the display.

Apparatus

1 Gas syringe, 100 ml	665 912
1 Glass connector, 2 x GL 18.....	667 312
1 Silicone gaskets, GL 18/6, set of 10.....	667 306
1 Sensor-CASSY 2	524 013
1 CASSY-Display USB	524 020USB
1 Temperature box, NiCr-Ni/NTC.....	524 045
1 Temperature probe, NiCr-Ni, fast.....	666 216

Carrying out the experiment

- Read the temperature T_0 from the CASSY-Display.
- Push the piston into the gas syringe quickly, and read the temperature T_1 .