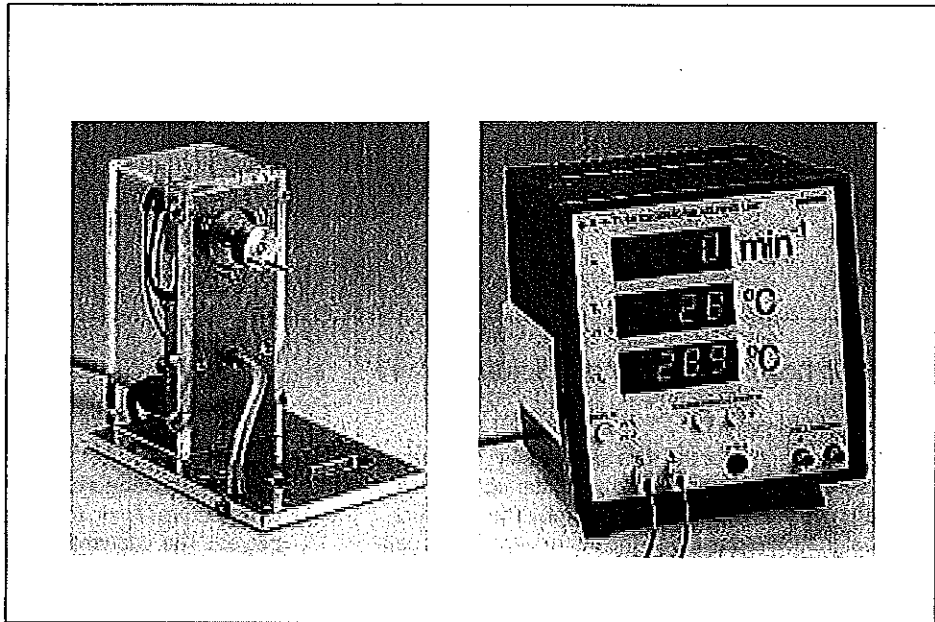




Sensor Unit  $pVn$   
Stirling Motor Instrument,  $pVnT$

04371.00  
04371.97

Operating Instructions



04371.00

04371.93

**1. PURPOSE AND CHARACTERISTIC PROPERTIES**

The sensor unit and instrument have been specially developed for the transparent Stirling Motor 04372.00. They are used for the measurement and display of all thermodynamic variable quantities associated with the Stirling motor.

**Pressure**

A sensitive, temperature compensated sensor continually measures the pressure in the Stirling motor.  
Output: analogue voltage value.

**Volume and speed**

The motion of the main piston monitored by an incremental transmitter linked to the crankshaft. This enables the rotational speed and the present air volume in the Stirling motor to be computed.

Speed output: 4-figure digital display.

Volume output: Analogue voltage value.

A  $pV$  curve can be displayed using, for example, an oscilloscope.

**Temperature**

The temperature in the cold and hot parts of the displacement cylinder is measured with NiCr/Ni thermocouples through two measurement connections.

Output: Two 4-figure digital displays.

Display  $T_1$  can be switched to differential measurement  $T_1 - T_2$ .

with the Stirling motor. This dog should be pushed up fully against the measurement tower before assembly.

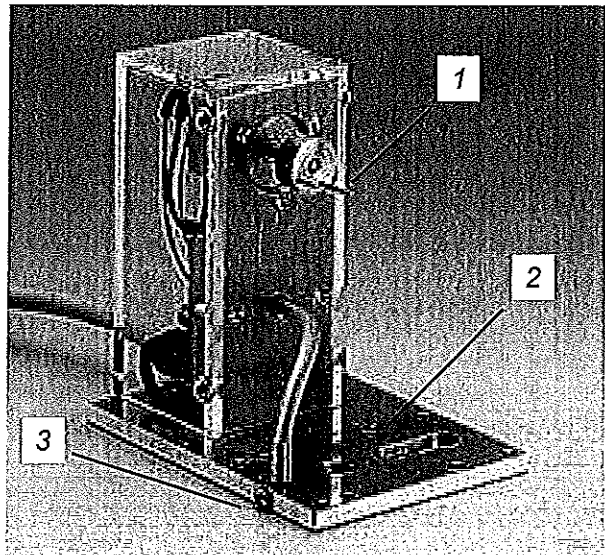
The Stirling motor is loosened from the blue base plate. Then the mounting plate at the bottom is removed with a screwdriver. The Stirling motor is then fastened to the mounting plate on the sensor unit (2).

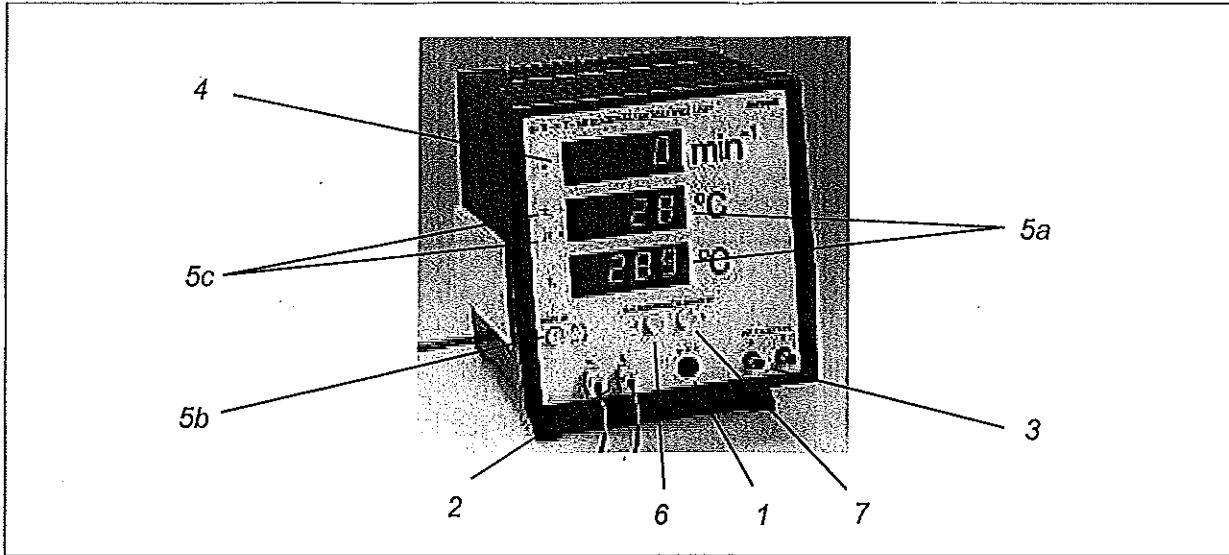
The dog on the incremental transmitter is pushed towards the Stirling motor, coupled to the mushroom shaped flywheel mass and tightened to the shaft. Finally, the Stirling motor is again screwed with the sensor tower to the blue base plate.

The pressure sensor must be joined to the hose connection on the mounting plate using a thick-walled piece of hose.

**2 MOUNTING THE  $pVn$  SENSOR UNIT**

The sensor unit and the Stirling motor must be firmly joined for the measurement of pressure, volume and speed. A dog is attached to the shaft of the incremental transmitter (1). It can be loosened and tightened using an Allen key supplied





**3 DESCRIPTION OF THE  $pVnT$  MEASUREMENT INSTRUMENT**

**1 8-pole DIN socket**

For the connection of the  $pVn$  sensor unit. The pressure sensor and incremental transmitter obtain their power supply through this connection. The measurement signals are passed to the instrument for processing and display.

**2 Inputs**

For NiCr/Ni thermocouples (Order no. 13615.01)

**3 Analogue outputs**

For pressure and volume for the display of the  $pV$  curve, for example, using an oscilloscope or a computer interface.

**4 Digital display**  
For the speed.

**5 Digital displays**

For the temperatures (5a). In the middle display the temperature  $T_1$  or the difference  $T_1 - T_2$  can be displayed. The latchable button „Display“ (5b) is used to select the display. Two light emitting diodes (5c) indicate which of the two quantities is being displayed.

**6 Button**

For balancing the two temperature probes (see Sect. 4 „Calibration on switching on the unit“).

**7 Button**

For confirming the position of the main piston for the computation of the volume (see Sect. 4 „Calibration on switching on the unit“).

Experimental arrangement

