

Displacement Sensor

1000568 / U11371

Instruction sheet

04/12 Hh



1. Description

Displacement sensor inside a 3B NET/og™ sensor box and featuring a built-in precision potentiometer plus a rotating pulley onto which a string can be wound in order to measure displacement. Suitable for recording periodic and oscillatory movements which can be traced by the turning of the string on the pulley without putting too much strain on the precision potentiometer when it reaches the limits of rotation.

The displacement sensor is detected automatically by the 3B NET/og™ unit.

2. Operation

- Set up the experiment with the displacement sensor included.
- If possible, select a zero point in such a way that the limits of rotation of the pulley are never reached.
- Turn on the 3B NET/og™ unit and connect the displacement sensor to one of the analog inputs, A or B, on the 3B NET/og™ unit.

- Wait for the unit to automatically detect the sensor (it will then display "S / U", meaning "displacement per volt").

3. Technical data

Internal diameter of pulley:	22 mm
Max. displacement:	61 mm
Resolution:	0.3 mm
Sensor:	Precision potentiometer using a wire
Max. angle of rotation for sensor pulley:	320°
Resistance range:	10 kΩ/44 mm
Max. permitted speed of rotation for long-term use:	1 turn/second
Max. permitted torque at end limits	100 Ncm

4. Apparatus supplied

- 1 Displacement sensor
- 1 Stand rod with thread, 120 mm
- 1 8-pin miniDIN cable, 1 m
- 1 Nylon thread, 1 m, 1 mm diam.
- 1 Instruction manual

5. Example experiment

Recording a pV diagram for a G-model Stirling motor using 3B NETlog™ and 3B NETlab™

Required equipment:

1 Stirling Engine G	1002594 / U10050
1 3B NETlog™ (115 V)	1000539 / U11300-115
or	
1 3B NETlog™ (230 V)	1000540 / U11300-230
1 3B NETlab™	1000544 / U11310
1 Displacement Sensor	1000568 / U11371
1 Relative Pressure Sensor ±1000 hPa	1000548 / U11323
1 Sensor Holder for Stirling Engine G	1008500 / U11372
1 DC Power Supply 0 – 20 V, 0 – 5 A (115 V)	1003311 / U33020
or	
1 DC Power Supply 0 – 20 V, 0 – 5 A (230 V)	1003312 / U33020
Experiment leads	1002843 / U138021

- Set up the experiment as in Fig. 1.
- Wrap the thread around the displacement sensor's pulley as in Fig. 2.
- Turn on the 3B NETlog™ unit and wait for it to automatically detect the sensor box.
- Connect the Stirling engine's DC motor to the DC power supply and set an output voltage of 6 V so that the Stirling engine operates at medium speed.
- Open the 3B NETlog™ template "Stirling engine G".
- Only allow the Stirling motor to operate at high-speed for short periods so as not to overstress the displacement sensor.

6. Disposal

- The packaging should be disposed of at local recycling points.
- Should you need to dispose of the equipment itself, never throw it away in normal domestic waste. Local regulations for the disposal of electrical equipment will apply.

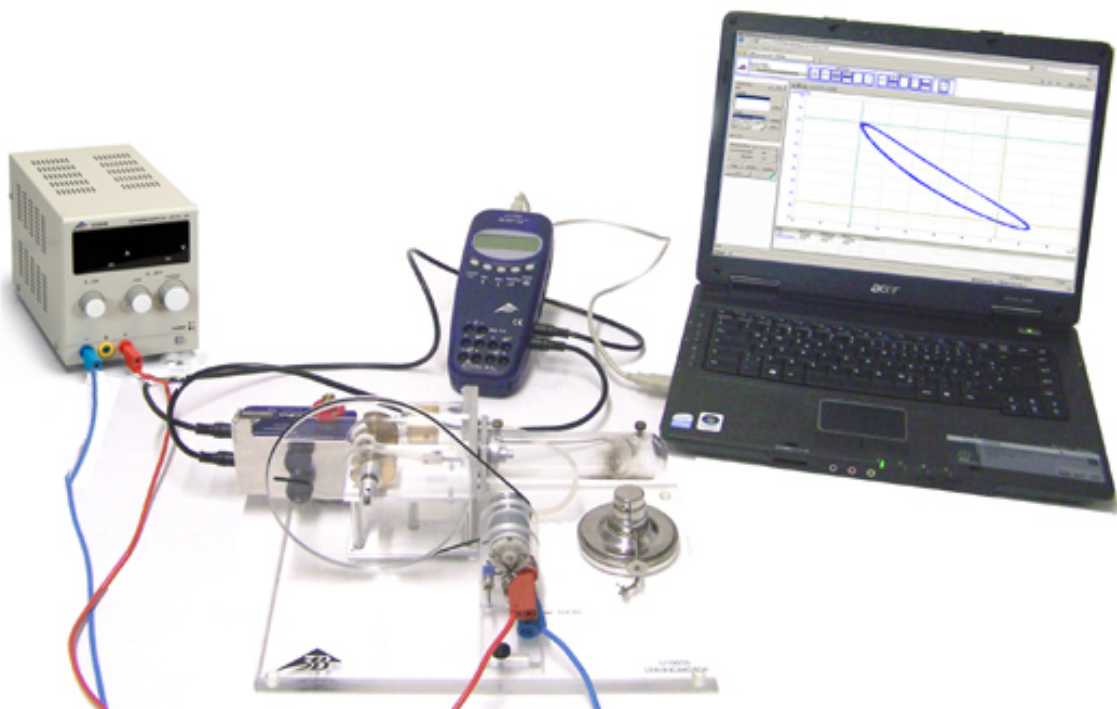
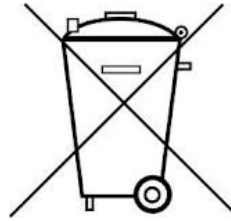


Fig. 1 Experiment set-up for recording the pV diagram of a G-model Stirling engine

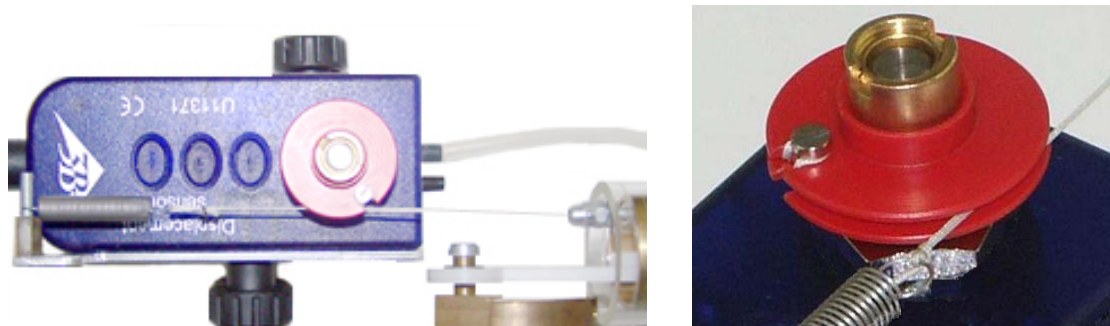


Fig. 2 Attachment of the thread to displacement sensor pulley

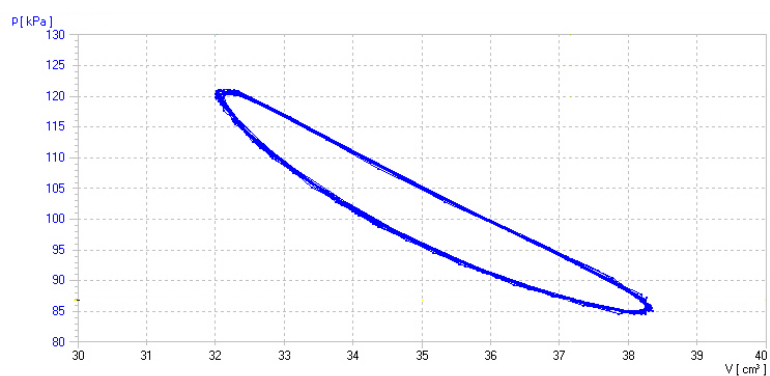


Fig. 3 Graph of pV diagram for Stirling engine G using 3B NETlab™

