

TC-K thermocouple 1000551

Instruction sheet

10/15 Hh



1. Safety instructions

- In order to avoid permanent damage to the supplied K-type thermocouple, never exceed the maximum temperature of 1370°C.

2. Scope of delivery

1 Sensor box
1 NiCr-Ni (TC-K) thermocouple sensor, 1.20 m
1 8-pin mini DIN connection cable, 60 cm

3. Description

The TC-K thermocouple is used to measure extremely high/low temperatures, in liquid nitrogen or oxygen or in a flame, for instance. The thermocouple is used in conjunction with the 3B NET/log™ interface.

Once connected, the sensor is automatically detected by the interface.

The apparatus consists of a sensor box, including a NiCr-Ni thermocouple sensor (type K), with room temperature compensation.

The immersion sensors 1002804 and 1002805 can likewise be connected to the sensor box.

4. Technical data

Measuring range: -270°C to +1370°C
Sensor type: NiCr-Ni (type K)
Accuracy: 0.2% and 3°C in the range 270°C to 0°C;
0.1% and 2°C in the range 0°C to 1370°C
Resolution: 1°C
Delay: 3 s approx. if temperature changes from 0°C to 100°C
Sensor cable: Insulated glass-fibre, 1.20 m

5. Operation

- Connect the thermocouple sensor to the sensor box and bring it into contact with the test surface.
- Wait for temperature compensation to complete before taking readings.

6. Applications

Measurements involving very low temperatures in liquified gases

Measuring temperature at points that are extremely difficult to access on account of the experiment set-up – this is facilitated by a probe 1.20 m long and a small diameter of only 1.5 mm.

Measurements conducted in the hot region of a flame without damaging or destroying the tip of the sensor

7. Sample experiments

Experimental demonstration of Newton's law of cooling



Fig. 1: Experimental demonstration of Newton's law of cooling

The type K immersion sensor 1002804 is used in this experiment.

- Connect the equipment as shown in Fig. 1 above. Switch on the 3B NET/og™ interface and wait for the interface to automatically detect and identify the sensor.
- Prepare the interface for recording readings over a time period of 10 hours, i.e. every 0.36 s, a total of 100,000 readings.
- Fill approximately half the vessel with boiling water (100°C approx.).

- Subsequently, start taking readings. After completing the experiment, plot the cooling curve.

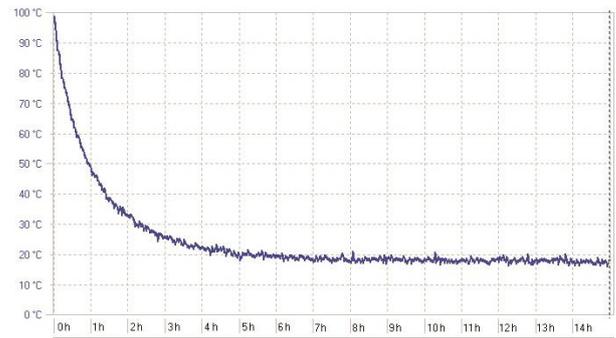


Fig. 2: Reduction of temperature over time