

## 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.

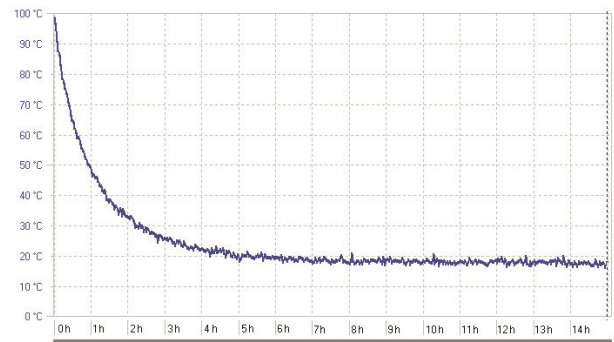


Fig. 2: Reduction of temperature over time