



Standard Platinum Resistance Thermometer

Model 230

User Manual

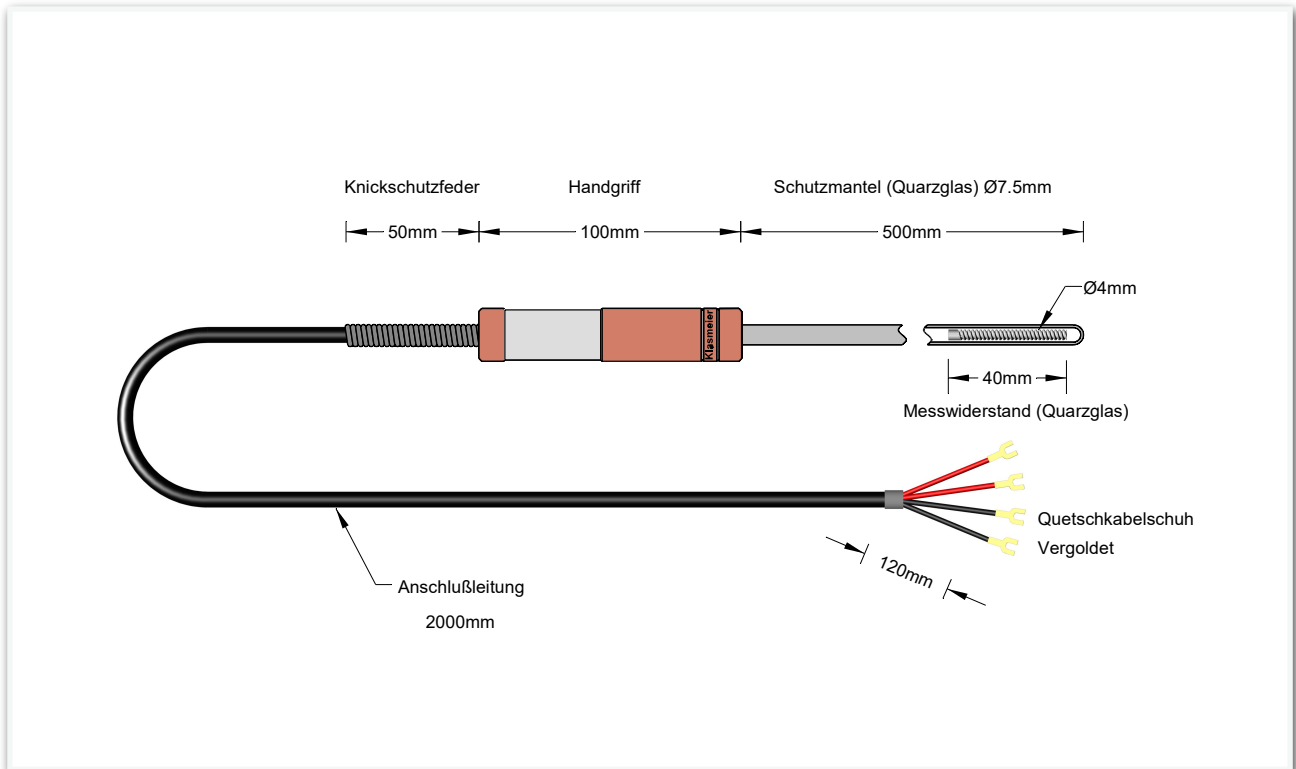


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1. Safety instructions

This user manual describes how to use the eXacal Standard Platinum Resistance Thermometer (SPRT) Model 230.



Technical drawing SPRT Model 230

These thermometers are used as precision instruments for accurate temperature measurement in various industrial and scientific applications.

Before using this precision thermometer, please observe the following basic safety instructions:

- Only use the thermometer within the specified temperature range of -200°C to 670°C.
- During prolonged use at high temperatures, the handle of the thermometer may become hot. Caution is advised to avoid burns.
- The handle must not exceed a maximum temperature of 100 degrees.
- Do not immerse the handle in liquids.
- Never use the thermometer to measure the temperature of live components.
- The protective tube may still be warm after use. Protect yourself from burns.

2. Introduction

2.1 Applications

eXacal standard platinum resistance thermometers (SPRTs) are precise temperature sensors that are widely used in a variety of industrial and scientific applications.

Their principle is based on the change in electrical resistance of a platinum wire as a function of temperature. The thermometers work in conjunction with an external measuring device to measure temperature changes in various applications such as dry block calibrators and temperature baths.

2.2 Main features

- The eXacal SPRT Model 230 is characterised by extremely low drift, making it ideal for long-term measurements.
- The SPRT is equipped with a quartz glass sheath that protects the fragile internal construction.

2.3 Calibration

As a reference thermometer, every eXacal SPRT must be calibrated.

It is recommended that the thermometer be recalibrated annually.

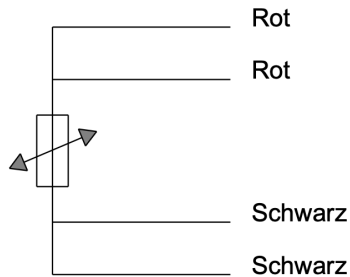
3. Technical Data

	Model 230
Temperature range	-200 °C to 670 °C
Nominal resistance	Pt25 (approx. 25.5 ohms)
Connection type	Four-wire
Sheath material	Quartz
Thermometer wire	Platinum
Handle dimensions	ø 20 mm x 100 mm
Protective tube diameter	ø 7.5 mm
Protective tube length	500 mm
Protective tube filling	Protective gas
Connection cable	2 m
Max. immersion depth	450 mm
Measuring resistance / temperature sensor	Length 40 mm (quartz)
Recommended measuring current	1 mA
Self-heating	1 mA at gallium fixed point
W value	W-gallium ≥ 1.11807 (according to ITS-90 requirements)

4. General operation

4.1 Connection to the measuring device

The eXacal SPRT is equipped with a 4-wire connection made of low-voltage copper wire. The crimp cable lugs are gold-plated.



4.2 Measuring current

The recommended measuring current is 1 mA.

4.3 Stability of measurements

It is important to allow the thermometer sufficient time to stabilise after immersion before taking measurements.

4.4 Immersion depth

To avoid measurement errors due to heat loss, the thermometer should be immersed sufficiently deep.

The maximum immersion depth is 480 mm.

The handle should not be immersed in liquids.

4.5 Overheating

To avoid damage, ensure that the thermometer is not used beyond the specified temperature range.

5. Care and handling guidelines

- The thermometer should be protected from mechanical shocks and vibrations.
- When not in use, the thermometer should be stored in its case.
- To avoid contamination, the thermometer should always be stored and used in a clean condition.

6. Troubleshooting

6.1 Common problems and solutions

- **R0/Rtpw significantly higher**

If the resistance value R0/Rtpw is significantly higher than expected, this could be due to mechanical shocks.

In this case, the thermometer should be subjected to relaxation ageing to relax the platinum wire. Measure the R0/Rtpw value again after ageing.

- **Measurements unstable**

If the measurements are unstable, the connections should be checked.

If the problem persists, there may be a winding short circuit in the measuring resistor and the thermometer may be damaged.

7. Warranty and limitation of liability

The eXacal standard platinum resistance thermometer is warranted against defects in materials and workmanship under normal operating conditions for a period of one year from the date of purchase.

The warranty is void if the device is misused or damaged.



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