

# Appendix A: Technical Data

The following specifications apply to an ambient temperature of +23 °C.

Find all terms explained in "Grundlagen der Messtechnik" ("Fundamentals of metrology"), DIN 1319.

## A.1: Specifications: MKT 50 as a High-Precision Resistance Meter

<b>Internal reference resistance</b>	approx. 400 Ω
<b>Measuring range</b>	approx. 0 Ω to 440 Ω
<b>Resolution</b>	40 μΩ (0.1 ppm full scale)
<b>Linearity error</b>	< 0.4 mΩ (< 1 ppm full scale)
<b>Measuring uncertainty<sup>a</sup></b> (confidence level: 95 %, number of measuring values: 50)	< 0.4 mΩ

*a This value does not include the calibration uncertainty of the reference resistor used.*

## A.2: Specifications: MKT 50 as a High-Precision Thermometer (Specifications Without Sensor)

<b>Measuring range</b> (depending on sensor)	-200 °C to 850 °C (as specified in EN 60751)
<b>Resolution</b>	0.1 mK (Pt 100)
<b>Linearity error</b>	< 1 mK (Pt 100) (< 1 ppm full scale)
<b>Measuring uncertainty<sup>a</sup></b> (confidence level: 95 %, number of measuring values: 50)	< 1 mK (Pt 100)
<b>Sensor</b>	Platinum sensor up to a resistance of 440 Ω

*a This value does not include the calibration uncertainty of the reference resistor used.*

## A.3: Instrument Data and Operating Conditions

<b>Internal reference resistor</b>	
Producer, type	VISHAY, VHP 101 (400 $\Omega$ )
Temperature coefficient	< 0.3 ppm/ $^{\circ}$ C (+15 $^{\circ}$ C to +25 $^{\circ}$ C)
Stability without strain (producer information)	$\pm$ 2 ppm max. dR after at least 10 years
<b>Measuring current <math>I_{DC}</math></b>	0.5 mA
<b>Measuring current <math>I_{eff}</math></b>	Normal operation: 0.41 mA During self-heating test: 0.29 mA (0.41/ $\sqrt{2}$ = 0.29)
<b>Self-heating test on</b>	Measuring current/ $\sqrt{2}$
<b>Measuring time</b> (complete, for both channels)	1.44 seconds
<b>Warm-up time</b>	60 minutes
<b>Sensor connections</b>	2 LEMO sockets, type 1S.304, 4-pin
<b>Sensor input (channels)</b>	2
<b>Data output</b>	<ul style="list-style-type: none"> <li>• LAN/Ethernet (RJ45 connector)</li> <li>• RS-232 (DE-9F 9-pin D-sub socket)</li> <li>• optionally via USB (with a USB–RS-232 converter)</li> </ul>
<b>Display</b>	Liquid crystal display, graphic, with LED backlight, 128 $\times$ 64 dots (approx. 65 mm $\times$ 35 mm)
<b>Keyboard</b>	20 keys
<b>Dimensions (L <math>\times</math> W <math>\times</math> H)</b> (without handle)	240 mm $\times$ 190 mm $\times$ 110 mm (9.4 in $\times$ 7.5 in $\times$ 4.3 in)
<b>Weight</b>	approx. 2 kg (4.4 lbs)
<b>Power supply</b>	2 $\times$ AA batteries / rechargeable batteries 1.2–1.5 V <i>or</i> Power adapter: input 100–240 VAC 50/60 Hz 1.0–0.5 A output 7.5 VDC 5.34 A 40 W max.
<b>Environmental conditions</b> <b>(EN 61010)</b>	indoor use only no direct exposure to sunlight
<b>Ambient operating temperature</b>	0 $^{\circ}$ C to 35 $^{\circ}$ C (32 $^{\circ}$ F to 95 $^{\circ}$ F)
<b>Air humidity</b>	< 90 % relative humidity, non-condensing

# Appendix B: EU Declaration of Conformity



Anton Paar GmbH hereby declares that the product listed below in the version offered for sale meets all the basic requirements of the applicable sections of the relevant EU directives in design and type.

This declaration will be deemed invalid should any unauthorized modifications be made to the product. Follow the information given in the instruction manual when setting up and operating the instrument.

Product designation: **MKT 50 Millikelvin-Thermometer**  
 Model: **MKT 50**  
 Manufacturer: **Anton Paar GmbH**

The product meets the requirements of the following directives:

- **Electromagnetic Compatibility 2004/108/EC**

Applied standards:

EN 61326-1:2006

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

The product is classified as a class B equipment and is not intended for the use in industrial area.

- **Low Voltage Directive 2006/95/EC**

Applied standards:

EN 61010-1:2001

Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements

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