

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-15220-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 29.03.2019

Date of issue: 29.03.2019

Holder of certificate:

**Günther GmbH Temperaturmesstechnik
Bauhofstraße 12, 90571 Schwaig**

Calibration in the fields:

Thermodynamic quantities

Temperature quantities

- Resistance thermometers
- Thermocouples

Abbreviations used: see last page

The calibration laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use calibration standards or equivalent calibration procedures listed here with different issue dates.

The calibration laboratory maintains a current list of all calibration standards / equivalent calibration procedures within the flexible scope of accreditation.

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Temperature Resistance thermometers	-20 °C to 100 °C	in temperature controlled liquid bath DKD-R 5-1:2018	0,1 K	Comparison with standard resistance thermometer
	-80 °C to -40 °C	in dry block calibrator DKD-R 5-1:2018	0,15 K	
	> -40 °C to 400 °C		0,10 K	
	> 400 °C to 600 °C		0,15 K	
Noble metal thermocouples	-20 °C to 100 °C	in temperature controlled liquid bath DKD-R 5-3:2018	0,6 K	Comparison with standard resistance thermometer
	-40 °C to 100 °C	in dry block calibrator DKD-R 5-3:2018	0,5 K	
	> 100 °C to 600 °C		0,4 K	
	> 600 °C to 1100 °C		5,6 K	Comparison with standard thermocouple
	> 1100 °C to 1300 °C	in tube furnace DKD-R 5-3:2018	6,7 K	
	> 600 °C to 900 °C		1,2 K	
	> 900 °C to 1300 °C		1,4 K	
	> 1300 °C to 1500 °C		2,5 K	
Base metal thermocouples	-20 °C to 100 °C	in temperature controlled liquid bath DKD-R 5-3:2018	0,5 K	Comparison with standard resistance thermometer
	-40 °C to 600 °C	in dry block calibrator DKD-R 5-3:2018	0,5 K	
	> 600 °C to 1100 °C		5,5 K	Comparison with standard thermocouple
	> 1100 °C to 1300 °C		6,7 K	
	> 600 °C to 900 °C	in tube furnace DKD-R 5-3:2018	1,2 K	
	> 900 °C to 1300 °C		1,5 K	

Abbreviations used:

DKD-R Calibration Guide of Deutscher Kalibrierdienst (DKD), published by the Physikalisch-Technischen Bundesanstalt

¹⁾ The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.