

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-K-19781-01-02 according to DIN EN ISO/IEC 17025:2018

Valid from: 27.03.2024

Date of issue: 27.03.2024

This annex is a part of the accreditation certificate D-K-19781-01-00.

Holder of partial accreditation certificate:

K. Meyer R.M.S. GmbH
Gotenweg 15–17, 58119 Hagen

with the location

K. Meyer R.M.S. GmbH
Gotenweg 15–17, 58119 Hagen

The calibration laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The calibration laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

This certificate annex is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de>.

Annex to the Partial Accreditation Certificate D-K-19781-01-02

Calibration in the fields:

Thermodynamic quantities**Humidity quantities**

- Climatic chambers (humidity) ^{b)}

Temperature quantities

- Direct reading thermometers ^{a)}
- Climatic chambers (temperature) ^{a)}
- Radiation thermometers
- Temperature indicators and simulators ^{a)}
- Temperature transmitters, data loggers
- Thermocouples ^{a)}
- Resistance thermometers ^{a)}

^{a)} also on-site calibration

^{b)} only on-site calibration

Within the measurands/calibration items marked with *, 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.

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 2 of 7

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Annex to the Partial Accreditation Certificate D-K-19781-01-02
Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Temperature quantities Standard resistance thermometers *	0,01 °C	DKD-R 5-1:2018 triple point of water	3.5 mK	Calibration at fixed point temperatures
	156.5985 °C	DKD-R 5-1:2018 freezing point of indium	20 mK	
	231.928 °C	DKD-R 5-1:2018 freezing point of tin	20 mK	
	419.527 °C	DKD-R 5-1:2018 freezing point of zinc	30 mK	
	660.323 °C	DKD-R 5-1:2018 freezing point of aluminium	50 mK	
Resistance thermometers, direct reading thermometers with resistance sensor *	-50 °C to 150 °C	DKD-R 5-1:2018 in liquid bath	0.1 K	Comparison with standard resistance thermometer
	100 °C to 200 °C	DKD-R 5-1:2018 in dry block calibrator	0.2 K	
	> 200 °C to 500 °C		0.5 K	
	> 500 °C to 650 °C		0.8 K	
	0 °C	DKD-R 5-1:2018 ice point	5.0 mK	Using deionized water with an electrical conductivity < 10 µS/m
	0.01 °C	DKD-R 5-1:2018 triple point of water	5.0 mK	Calibration at fixed point temperature
	-40 °C to 100 °C	DKD-R 5-1:2018 in climatic chamber	1.5 K	Comparison with resistance thermometer
	> 100 °C to 180 °C		2.0 K	
Temperature data loggers with resistance sensor *	-40 °C to 100 °C	DKD-R 5-1:2018 in climatic chamber	2.0 K	Comparison with resistance thermometer
	> 100 °C to 180 °C		2.5 K	

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 3 of 7

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Annex to the Partial Accreditation Certificate D-K-19781-01-02
Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Base metal thermocouples, direct reading thermometers with thermocouple sensor *	-50 °C to 150 °C	DKD-R 5-3:2018 in liquid bath	0.3 K	Comparison with standard resistance thermometer
	100 °C to 200 °C	DKD-R 5-3:2018 in dry block calibrator	0.4 K	
	> 200 °C to 500 °C		0.8 K	
	> 500 °C to 650 °C		1.5 K	
	> 500 °C to 800 °C	DKD-R 5-3:2018 in furnace with compensation block	1.8 K	Comparison with standard thermocouple
	> 800 °C to 1000 °C		2.5 K	
	> 1000 °C to 1300 °C		3.0 K	
Noble metal thermocouples *	-50 °C to 150 °C	in liquid bath DKD-R 5-3:2018	0.5 K	Comparison with standard resistance thermometer
	> 150 °C to 650 °C	DKD-R 5-3:2018 in dry block calibrator	1.0 K	
	> 500 °C to 800 °C	DKD-R 5-3:2018 in furnace with compensation block	1.8 K	Comparison with standard thermocouple
	> 800 °C to 1000 °C		2.5 K	
	> 1000 °C to 1300 °C		3.0 K	
Direct reading thermometers with thermocouple sensor *	-40 °C to 100 °C	DKD-R 5-3:2018 in climatic chamber	2.0 K	Comparison with resistance thermometer
	> 100 °C to 180 °C		2.5 K	
Temperature data loggers with thermocouple sensor *	-40 °C to 100 °C	DKD-R 5-3:2018 in climatic chamber	3.0 K	Comparison with resistance thermometer
	> 100 °C to 180 °C		3.5 K	
Liquid baths	-50 °C to 150 °C	KA007, Version 1.3	0.2 K	Comparison with standard resistance thermometer
	> 150 °C to 200 °C		0.3 K	
Temperature indicators and simulators for resistance thermometers *	-200 °C to 800 °C	DKD-R 5-5:2018	0.1 K	Basic values of resistance according to DIN EN 60751:2008
Temperature indicators and simulators for base metal thermocouples *	-200 °C to 1300 °C	DKD-R 5-5:2018	0.3 K	Basic values of thermoelectric voltage according to DIN EN 60584- 1:2014
Temperature indicators and simulators for noble metal thermocouples *	0 °C to 1500 °C	DKD-R 5-5:2018	0.4 K	

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 4 of 7

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Annex to the Partial Accreditation Certificate D-K-19781-01-02
Permanent Laboratory

Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Measuring locations in climatic chambers with air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method C measurement in air	1.5 K	Comparison with reference thermometer
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 500 °C		3.0 K	
Climatic chambers with air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method A and B measurement in air	1.5 K	
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 500 °C		3.0 K	
Measuring locations in climatic chambers without air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method C measurement in air	1.5 K	
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 350 °C		3.0 K	
Climatic chambers without air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method A and B measurement in air	3.0 K	
	> 0 °C to 100 °C		2.2 K	
	> 100 °C to 350 °C		5.0 K	
Radiation thermometers *	35 °C to 100 °C	VDI/VDE 3511 Part 4.4:2005 calibration scheme IIa, spectral range 8–14 µm	2.0 K	Calibration against reference radiator
	> 100 °C to 300 °C		3.5 K	
	> 300 °C to 500 °C		5.0 K	

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 5 of 7

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Annex to the Partial Accreditation Certificate D-K-19781-01-02

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Temperature quantities				
Temperature indicators for resistance thermometers *	–200 °C to 800 °C	DKD-R 5-5:2018	0.3 K	Basic values of resistance according to DIN EN 60751:2008
Temperature indicators for base metal thermocouples *	–100 °C to 1350 °C	DKD-R 5-5:2018	0.6 K	Basic values of thermoelectric voltage according to DIN EN 60584-1:2014
Temperature indicators for noble metal thermocouples *	0 °C to 1450 °C	DKD-R 5-5:2018	0.6 K	
Resistance thermometers, direct reading thermometers with resistance sensor *	–30 °C to 150 °C	DKD-R 5-1:2018 in liquid bath	0.4 K	Comparison with standard resistance thermometer
	–50 °C to 200 °C	DKD-R 5-1:2018 in dry block calibrator	0.8 K	
	> 200 °C to 650 °C		2.5 K	
Thermocouples, direct reading thermometers with thermocouple sensor *	–30 °C to 150 °C	DKD-R 5-3:2018 in liquid bath	0.6 K	
	–50 °C to 200 °C	DKD-R 5-3:2018 in dry block calibrator	1.0 K	
	> 200 °C to 650 °C		2.5 K	
Measuring locations in climatic chambers with air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method C measurement in air	1.5 K	Comparison with reference thermometer
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 500 °C		3.0 K	
Climatic chambers with air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method A and B measurement in air	1.5 K	
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 500 °C		3.0 K	
Measuring locations in climatic chambers without air circulation *	–50 °C to 0 °C	DKD-R 5-7:2018 method C measurement in air	1.5 K	
	> 0 °C to 100 °C		1.5 K	
	> 100 °C to 200 °C		1.5 K	
	> 200 °C to 350 °C		3.0 K	
Climatic chambers without air *	–50 °C to 0 °C	DKD-R 5-7:2018 method A and B measurement in air	3.0 K	
	> 0 °C to 100 °C		2.2 K	
	> 100 °C to 350 °C		5.0 K	

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 6 of 7

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Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Humidity quantities Measuring locations in climatic chambers with air circulation *	10 % to 50 %	DKD-R 5-7:2018 method C air temperature: 5 °C to 90 °C	4.5 %	Measurement with reference aspiration psychrometer or capacitive reference humidity sensors for relative humidity
	> 50 % to 95 %		5.0 %	
Climatic chambers with air circulation *	10 % to 50 %	DKD-R 5-7:2018 method A and B air temperature: 5 °C to 90 °C	4.5 %	The measurement uncertainty is an absolute value of relative humidity
	> 50 % to 95 %		5.0 %	

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V. – German institute for standardization
DKD-R	Calibration Guide of Deutscher Kalibrierdienst (DKD), published by the Physikalisch-Technischen Bundesanstalt
EN	Europäische Norm – European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardisation
KA	In-house procedure of K. Meyer R.M.S. GmbH
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.
VDI	Verein Deutscher Ingenieure e.V.

Valid from: 27.03.2024

Date of issue: 27.03.2024

Page 7 of 7

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