Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-11030-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **28.05.2021**

Date of issue: 07.09.2022

Holder of accreditation certificate:

Technologiezentrum der SCHÜCO International KG
Karolinenstrasse 1-15, 33609 Bielefeld

The calibration laboratory meets the minimal requirements of DIN EN ISO/IEC 17025:2018 and, if applicable, additional legal and normative requirements, including those in relevant sectoral schemes, in order to carry out the conformity assessment activities listed below.

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

Mechanical quantities
- **Pressure** [a)]

Fluid quantities
- **Volume of flowing gases** [a)]
- **Volume of flowing liquids** [a)]

Thermodynamic quantities

Temperature quantities
- **Direct reading thermometers** [a)]
- **Temperature indicators and simulators** [a)]
- **Resistance thermometers** [a)]

Humidity quantities
- **Devices for relative humidity** [a)]

[a)] also on site calibrations

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.

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Thermocouple temperature indicators and simulators						
Type J	-210 °C	to	1200 °C	DKD-R 5-5:2018	0.3 K	
Type K	-200 °C	to	1372 °C		0.4 K	
Type N	-200 °C	to	1300 °C		0.4 K	
Type R	0 °C	to	1767 °C		0.6 K	
Type S	0 °C	to	1767 °C		0.5 K	
Type T	-250 °C	to	400 °C		0.7 K	
Direct reading thermometers with resistance sensors	0 °C			Ice point DKD-R 5-1:2018	10 mK	
	50 °C	to	< 150 °C	within silicone oil bath DKD-R 5-1:2018	60 mK	Comparison with resistance thermometers
	150 °C	to	300 °C		0.1 K	
	-40 °C	to	140 °C	within block calibrator DKD-R 5-1:2018	0.11 K	
	> 140 °C	to	420 °C		0.3 K	
Direct reading thermometers with non-precious metal thermocouple sensors	-40 °C	to	140 °C	within block calibrator DKD-R 5-1:2018	0.5 K	Comparison with resistance thermometers
	> 140 °C	to	420 °C		0.6 K	
Relative humidity electric hygrometers and humidity sensors, no psychrometers	33 %	to	70 %	within climate chamber air temperature 23 °C DKD-R 5-8:2019	1.8 %	Comparison with reference sensor Uncertainty of measurement expressed in relative humidity
	15 %	to	60 %	within humidity generator air temperature 23 °C DKD-R 5-8:2019	1.4 %	Uncertainty of measurement expressed in relative humidity
	> 60 %	to	90 %		1.6 %	
Pressure Excess pressure	-10 kPa	to	10 kPa	DKD-R 6-1:2014	1.2 Pa	Pressure medium: Air precision pressure regulator
Absolut pressure	800 hPa	to	1100 hPa	DKD-R 6-1:2014	0.7 hPa	Pressure medium: Air Precision absolute pressure transmitter
Volume flow rate dV/dt of flowing gases	0.029 m³/h	to	4.0 m³/h	KR-0013-00 Comparison with reference standard	1 %	Measure medium: Air Conversion via density Comparison meter: nozzle calibration system
	> 4.0 m³/h	to	1600 m³/h			Measure medium: Air Conversion via density Comparison meter: Volumetric gas meter

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Volume flow rate dV/dt of flowing liquids	30 L/h to 600 L/h	KR-0005-02 Comparison with reference standard	1 %	Measure medium: Water Comparison meters: Electromagnetic flowmeters
	240 L/h to 2500 L/h			Measure medium: Water Comparison meters: Coriolis mass flow meters
	2350 L/h to 18 900 L/h			Measure medium: Water Comparison meters: Electromagnetic flowmeters

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Thermocouple temperature indicators and simulators				DKD-R 5-5:2018		
Type J	-210 °C	to	1200 °C		0.4 K	
Type K	-200 °C	to	1372 °C		0.5 K	
Type N	-200 °C	to	1300 °C		0.5 K	
Type R	0 °C	to	1767 °C		0.8 K	
Type S	0 °C	to	1767 °C		0.65 K	
Type T	-250 °C	to	400 °C		0.9 K	
Direct reading thermometers with resistance sensors	0 °C			Ice point DKD-R 5-1:2018	12 mK	
	50 °C	to	< 150 °C	within silicone oil bath DKD-R 5-1:2018	75 mK	Comparison with resistance thermometers
	150 °C	to	300 °C		0.12 K	
	-40 °C	to	140 °C	within block calibrator DKD-R 5-1:2018	0.13 K	
	> 140 °C	to	420 °C		0.45 K	
Direct reading thermometers with non-precious metal thermocouple sensors	-40 °C	to	140 °C	within block calibrator DKD-R 5-1:2018	0.50 K	Comparison with resistance thermometers
	> 140 °C	to	420 °C		0.75 K	
Relative humidity electric hygrometers and humidity sensors, no psychrometers	15 %	to	60 %	within humidity generator air temperature 23 °C DKD-R 5-8:2019	1.7 %	Uncertainty of measurement expressed in relative humidity
	> 60 %	to	90 %		2.0 %	
Pressure Excess pressure	-10 kPa	to	10 kPa	DKD-R 6-1:2014	1.4 Pa	Pressure medium: Air precision pressure regulator
Absolut pressure	800 hPa	to	1 100 hPa		0.8 hPa	Pressure medium: Air Precision absolute pressure transmitter
Volume flow rate dV/dt of flowing gases	0.029 m³/h	to	4 m³/h	Comparison with reference standard	1 %	Measure medium: Air Conversion via density Comparison meter: nozzle calibration system

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Volume flow rate *dV*/*dt* of flowing gases	0 m³/h	to	4.2 m³/h	KR-0013-00 Comparison with reference standard	1 %	Measure medium: Air Conversion via density Comparison meter: Thermic mass flow meters
	> 4.2 m³/h	to	1600 m³/h			Measure medium: Air Conversion via density Comparison meter: Volumetric gas meter
	> 0.5 m³/h	to	1600 m³/h			Measure medium: Air Conversion via density Comparison meter: Laminar flow
Volume flow rate *dV*/*dt* of flowing liquids	30 L/h	to	600 L/h	KR-0005-02 Comparison with reference standard	1 %	Measure medium: Water Comparison meters: Electromagnetic flowmeters
	240 L/h	to	2500 L/h			Measure medium: Water Comparison meters: Coriolis mass flow meters
	2350 L/h	to	18 900 L/h			Measure medium: Water Comparison meters: Electromagnetic flowmeters

Abbreviations used:

CMC	Calibration and measurement capabilities
DIN	Deutsches Institut für Normung e.V.
DKD-R	Guideline of the German Calibration Service „Deutscher Kalibrierdienst“ (DKD), published by Physikalisch-Technische Bundesanstalt
KR-…	In house method of Technologiezentrum der SCHÜCO International KG