Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-19566-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **06.12.2023**

Date of issue: 06.12.2023

Holder of accreditation certificate:

CETA Testsysteme GmbH
Marie-Curie-Straße 35-37, 40721 Hilden

with the location

CETA Testsysteme GmbH
Marie-Curie-Straße 35-37, 40721 Hilden

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.

Mechanical quantities

- **Pressure** [a)*)]

Fluid Quantities

- **Gas flow rate** [a)]

[a)] also on-site calibration

Within the measurement quantities/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.

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
Pressure * Negative and positive gauge pressure p_e	-1 bar to - 0,1 bar		DKD-R 6-1: 2014	$30 \cdot 10^{-2}$ mbar	Pressure medium: Gas
	-0,1 bar to -0,07 bar			$10 \cdot 10^{-2}$ mbar	
	-0,07 bar to -0,01 bar			$50 \cdot 10^{-3}$ mbar	
	-0,01 bar to 0,03 bar			$3 \cdot 10^{-4} \cdot p_e$ but not lower than 3 µbar	
	> 0,03 bar to 0,07 bar			$50 \cdot 10^{-3}$ mbar	
	> 0,07 bar to 0,1 bar			$10 \cdot 10^{-2}$ mbar	
	> 0,1 bar to 1,0 bar			$20 \cdot 10^{-2}$ mbar	
	> 1,0 bar to 10 bar			2 mbar	
	> 10 bar to 17 bar			8 mbar	
	> 17 bar to 30 bar			20 mbar	
	> 30 bar to 60 bar			30 mbar	
Absolute pressure p_{abs}	0,05 bar to 0,7 bar			2,5 mbar	
	0,7 bar to 1,3 bar			$20 \cdot 10^{-2}$ mbar	
	1,3 bar to 10 bar			2,5 mbar	
	10 bar to 40 bar			12 mbar	
Gas flow rate Volume flow rate *dV/dt* of flowing gases	0,1 ml/min	0,5 ml/min	Calbration medium: Air calibration object upstream of the standards A-K 7.4-0 (Revision 2) A-K 7.4-2 (Revision 7)	3 %	Measuring devices with display in standard p_n = 1 000 mbar T_n = 20 °C
	0,5 ml/min	1 ml/min		2 %	
	1 ml/min	220 l/min		1 %	
	220 l/min	420 l/min	DIN EN ISO 20486:2018-05	1,5 %	
Helium leak rate q_{pv}	$1 \cdot 10^{-9}$ mbar · l/s	$1 \cdot 10^{-6}$ mbar · l/s		6 %	Temperature oft the helium leak 23 °C operation A, B
Leak rate *q* in gases	$5 \cdot 10^{-3}$ mbar · l/s	$1 \cdot 10^{-6}$ mbar · l/s		3 %	Temperature oft he leak 23 °C operation G

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Pressure * Negative and positive gauge pressure p_e	-1 bar	to	-0,1 bar	DKD-R 6-1: 2014	$30 \cdot 10^{2}$ mbar	Pressure medium: Gas
	-0,1 bar	to	-0,07 bar		$10 \cdot 10^{2}$ mbar	
	-0,07 bar	to	-0,005 bar		$50 \cdot 10^{-3}$ mbar	
	-0,005 bar	to	0,005 bar		$10 \cdot 10^{-3}$ mbar	
	> 0,005 bar	to	0,07 bar		$50 \cdot 10^{-3}$ mbar	
	> 0,07 bar	to	0,1 bar		$10 \cdot 10^{2}$ mbar	
	> 0,1 bar	to	1,0 bar		$20 \cdot 10^{2}$ mbar	Pressure medium: Gas
	> 1,0 bar	to	10 bar		2,0 mbar	
	> 10 bar	to	17 bar		8,0 mbar	
	> 17 bar	to	30 bar		20 mbar	
	> 30 bar	to	60 bar		30 mbar	
Absolute pressure p_{abs}	0,05 bar	to	0,7 bar		2,5 mbar	
	0,7 bar	to	1,3 bar		$20 \cdot 10^{2}$ mbar	
	1,3 bar	to	10 bar		2,5 mbar	
	10 bar	to	40 bar		12 mbar	
Gas flow rate Volume flow rate *dV/dt* of flowing gases	0,1 ml/min	to	0,5 ml/min	Calbration medium: Air calibration object upstream of the standards A-K 7.4-0 (Revision 2) A-K 7.4-2 (Revision 7)	3 %	Measuring devices with display in standard p_n = 1 000 mbar T_n = 20 °C
	0,5 ml/min	to	2 ml/min		2 %	
	2 ml/min	to	200 l/min		1,5 %	
	200 l/min	to	420 l/min		1,5 %	

Abbreviations used:

CMC	Calibration and measurement capabilities (Calibration and measurement options)
DKD-R	Guideline of Deutscher Kalibrierdienst (DKD), published by the Physikalisch-Technische Bundesanstalt
A-K X.X-X	Laboratory calibration instructions CETA Test systems GmbH