Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-21152-02-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 02.01.2023

Date of issue: 02.01.2023

Holder of Accreditation Certification:

AVL Analytical Technologies GmbH
Graf-Landsberg-Straße 1c, 41460 Neuss

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.

Calibrations at the locations:

Graf-Landsberg-Straße 1c, 41460 Neuss
Max-Roth-Straße 7, 76571 Gaggenau

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.

Calibrations in the fields:

Mechanical quantities

- **Pressure [a] ***

Fluid quantities

- **Gas flow rate [a]**

Thermodynamic quantities

Temperature quantities

- **Direct reading thermometers [a] ***

[a] also 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.

Permanent Laboratory Neuss

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Pressure * Relative pressure ρ_e	-1000 hPa to 2200 hPa	DKD-R 6-1:2014	0,64 hPa	
Absolute pressure ρ_{abs}	30 hPa to 700 hPa		0,60 hPa	
	> 700 hPa to 1300 hPa		0,20 hPa	
	> 1300 hPa to 3500 hPa		0,60 hPa	
Gas flow rate Volume flow MFC	1 L/min to 200 L/min	Laminar flow elements with analysis unit (11 - 145 m^3/min Betaflow with analysis unit)	0,1 L/min + 0,4 % of the MV	Measurement range specifications at standard conditions: T_{st}=20°C, $\rho_{st,abs}$=1013,25 mbar ΔT maximum temperature deviation between the temperature during the calibration and the temperature during the calibration of the standards
Volume flow Venturi	1 m^3/min to 145 m^3/min		0,42 % of the MV (at $\Delta T \leq 2$ K during calibration) 0,62 % of the MV (at $\Delta T \leq 5$ K during calibration)	
Volume flow rate of nitrogen (N_2)/ Gas divider Type SlimLine	0,0025 L/min to 10 L/min	Fluke molbox/molbloc Mass flow measuring system	0,35 %	Measurement range given under standard conditions: T_{st} = 20 °C, $p_{st,abs}$ = 1013,25 mbar
Type i60	0,01 L/min to 10 L/min		0,38 %	
Volume flow rate of propane (C_3H_8) / Critical Flow Venturi (CFO) devices	0,02 L/min to 10 L/min		0,58 %	
Temperature quantities * Direct reading thermometers with resistance sensor	5 °C to 70 °C	in dry block calibrator DKD-R 5-1:2018	0,54 K	Dry block calibrator as reference standard

Permanent Laboratory Gaggenau

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Gas flow rate				
Volume flow rate of nitrogen (N_2)/ Gas divider Type SlimLine	0,0025 L/min to 10 L/min	Fluke molbox/molbloc Mass flow measuring system	0,35 %	Measurement range given under standard conditions: T_{st} = 20 °C, $p_{st,abs}$ = 1013,25 mbar
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On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
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Gas flow rate Volume flow MFC	1 L/min to 200 L/min	Laminar flow elements with analysis unit (11 - 145 m^3/min Betaflow with analysis unit)	0,1 L/min + 0,4 % of the MV	Measurement range specifications at standard conditions: T_{st}=20°C, $\rho_{st,abs}$=1013,25 mbar ΔT maximum temperature deviation between the temperature during the calibration and the temperature during the calibration of the standards
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Abbreviations used:

DKD-R	Guideline of the german calibration service (DKD), published by the Physikalisch-Technischen Bundesanstalt
MFC	Mass Flow Controller
MV	Mean Value