Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

Annex to the Accreditation Certificate D-K-15149-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 2016-09-15 to 2021-09-14 Date of issue: 2016-09-15

Holder of certificate:

Trigas FI GmbH
Erdinger Str. 2b, 85375 Neufahrn, Germany

Head:	Athanasios Trigas
Deputy:	Harald Alexander
	Cynthia Trigas

Accredited as calibration laboratory since: 2002-07-03

Calibrations in the fields:

Fluid quantities:
- **Liquid flow rate**
- **Volume of flowing liquids**
- **Mass of flowing liquids**
- **Gas flow rate**
- **Volume of flowing gases**
- **Mass of flowing gases**

Permanent Laboratory

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability [1]	Remarks
Liquid flow rate Volume flow rate d*V*/d*t* and volume *V* of flowing liquids	0.05 mL/min to 1500 L/min	Volumetric measurement (piston prover), Measured fluid: liquids with densities of 700 kg/m³ to 1100 kg/m³	0.04 %	Measuring instrument with frequency or analogue output or visual display
	10 L/min to 5000 L/min	Volumetric measurement (water flow calibrator) Measured fluid: water with density of 1000 kg/m³	0.09 %	Measuring instrument with frequency output
			0.12 %	Measuring instrument with analogue output or visual display
Mass flow rate d*m*/d*t* and mass *m* of flowing liquids	0.04 g/min to 1500 kg/min	Volumetric measurement (piston prover), Unit conversion via density, Viscosities of 0,3 mm²/s to 1600 mm²/s	0.05 %	Measuring instrument with frequency or analogue output or visual display
	10 kg/min to 5000 kg/min	Volumetric measurement (water flow calibrator) Unit conversion via density of 1,0 mm²/s	0.11 %	Measuring instrument with frequency output
			0.13 %	Measuring instrument with analogue output or visual display
Gas flow rate Volume flow rate d*V*/d*t* and volume *V* of flowing gases	Measuring range stated in standard conditions	Calibration object always downstream to flow standards		Measuring instrument with display of flow rate under actual condition or under standard condition Standard density in according to international accepted normative documents
	1 mL/min to 85 L/min	Laminar flow elements Calibration gas: dry air (dew point < -15 °C)	0.34 %	Measuring instrument with frequency or analogue output or visual display
	10 L/min to 20000 L/min	critical nozzle Calibration gas: dry air (dew point < -15 °C)	0.27 %	
	1 L/min to 1500 L/min	Bell prover Calibration gas: dry air (dew point < -15 °C)	0.26 %	
	20 mL/min to 4000 mL/min	Seal free piston prover, Calibration gas: dry air (dew point < -15 °C)	0.3 %	

[1] The best measurement capabilities are stated according to DAkkS-DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 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.

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability [1)]	Remarks
Gas flow rate Volume flow rate d*V*/d*t* and volume *V* of flowing gases	Measuring range stated in standard conditions	Calibration object always downstream to flow standards		Measuring instrument with display of flow rate under actual condition or under standard condition Standard density in according to international accepted normative documents
	1 L/min to 700 L/min	Bell prover Calibration gases: - nitrogen N_2 - argon Ar - helium He - and their mixtures	0.26 %	Measuring instrument with frequency or analogue output or visual display technically pure gases or mixtures with traced composition
	20 mL/min to 4000 mL/min	Seal free piston prover, Calibration gases: - nitrogen N_2 - argon Ar - helium He - and their mixtures	0.35 %	
	1 L/min to 300 L/min	Bell prover Calibration gases: - methane CH_4 - carbon dioxide CO_2 - propane C_3H_8 - and their mixtures - hydrogen H_2	0.26 %	
	20 mL/min to 4000 mL/min	Seal free piston prover, Calibration gases: - methane CH_4 - carbon dioxide CO_2 - propane C_3H_8 - and theirs mixtures - hydrogen H_2	0.35 %	
Mass flow rate d*m*/d*t* and mass *m* of flowing gases	1.3 mg/min to 110 g/min	Calibration object always downstream to flow standards Laminar flow elements Calibration gas: dry air (dew point < -15 °C)	0.36 %	Measuring instrument with frequency or analogue output or visual display
	12 g/min to 1440 kg/h	critical nozzle Calibration gas: dry air (dew point < -15 °C)	0.24 %	
	1290 mg/min to 1939 g/min	Bell prover Calibration gas: dry air (dew point < -15 °C)	0.27 %	
	25.8 mg/min to 5.17 g/min	Seal free piston prover, Calibration gas: dry air (dew point < -15 °C)	0.3 %	

[1)] The best measurement capabilities are stated according to DAkkS-DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 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.

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability [1)]	Remarks
Gas flow rate Mass flow rate d*m*/d*t* and mass *m* of flowing gases	1250 mg/min to 875 g/min 1784 mg/min to 1249 g/min 178 mg/min to 125 g/min	Bell prover Calibration gases: - nitrogen N_2 - argon Ar - helium He - and their mixtures	0.27 %	Measuring instrument with frequency or analogue output or visual display technically pure gases or mixtures with traced composition
	25 mg/min to 5.0 g/min 35 mg/min to 7.14 g/min 3.57 mg/min to 714 mg/min	Seal free piston prover, Calibration gases: - nitrogen N_2 - argon Ar - helium He - and their mixtures	0.35%	
	717 mg/min to 215 g/min 1970 mg/min to 593 g/min 2010 mg/min to 603 g/min to 90 mg/min 27 g/min	Bell prover Calibration gases: - methane CH_4 - carbon dioxide CO_2 - propane C_3H_8 - and their mixtures - hydrogen H_2	0.26 %	
	14.3 mg/min to 2.870 g/min 39.5 mg/min to 7.907 g/min 40 mg/min to 8.042 g/min 1.8 mg/min to 360 mg/min	seal free piston prover Calibration gases: - methane CH_4 - carbon dioxide CO_2 - propane C_3H_8 - and their mixtures - hydrogen H_2	0.35 %	

[1)] The best measurement capabilities are stated according to DAkkS-DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 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.