Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-19206-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **28.11.2022**

Date of issue: 28.11.2022

Holder of accreditation certificate:

Vier Gas Services GmbH & Co. KG
pigsar
Halterner Straße 125, 46284 Dorsten

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.

Calibration in the fields:

Mechanical Quantities

Fluid quantities

- **Gas flow rate**
- **Mass of flowing gases**
- **Volume of flowing gases**

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
Fluid quantities Volume flow rate Q_v respectively volume of flowing gases	8 m³/h to < 9 m³/h	pigsar Nr. 7.54:2022-08	0,16 %	high-pressure natural gas, 15 bar to 55 bar, bypass part of the test bench
	9 m³/h to < 12 m³/h		0,15 %	
	12 m³/h to < 19 m³/h		0,14 %	
	19 m³/h to < 1850 m³/h		0,13 %	
	1850 m³/h to 7200 m³/h		0,14 %	
	40 m³/h to < 200 m³/h	pigsar Nr. 7.54:2022-08	0,16 %	high-pressure natural gas, 8 bar to 65 bar, closed loop part of the test bench
	200 m³/h to < 1440 m³/h		0,14 %	
	1440 m³/h to < 4000 m³/h		0,16 %	
	4000 m³/h to < 12000 m³/h		0,18 %	
	12000 m³/h to 30000 m³/h		0,19 %	
Mass flow rate Q_M respectively mass of flowing gases	100 kg/h to $3 \cdot 10^5$ kg/h	pigsar Nr. 7.54:2022-08		high-pressure natural gas, 15 bar to 55 bar, bypass part of the test bench
		Q_V: 8 m³/h to < 9 m³/h	0,26 %	
		Q_V: 9 m³/h to < 12 m³/h	0,25 %	
		Q_V: 12 m³/h to 7200 m³/h	0,24 %	
	300 kg/h to $1{,}24 \cdot 10^6$ kg/h	pigsar Nr. 7.54:2022-08		high-pressure natural gas, 8 bar to 65 bar, closed loop part of the test bench
		Q_V: 40 m³/h to < 200 m³/h	0,25 %	
		Q_V: 200 m³/h to < 1440 m³/h	0,24 %	
		Q_V: 1440 m³/h to < 4000 m³/h	0,25 %	
		Q_V: 4000 m³/h to < 12000 m³/h	0,27 %	
		Q_V: 12000 m³/h to 30000 m³/h	0,28 %	
Discharge Coefficient C pressure differential device	0,5 to 1,3	pigsar Nr. 7.54-D: 2022-08 Δp: 10 mbar to 2500 mbar Q_V: 8 m³/h to 7200 m³/h	0,20 %	high-pressure natural gas, 15 bar to 55 bar, bypass part of the test bench, discharge coefficient C determined according to ISO 5167:2003, Δp: differential pressure of pressure differential device
	0,5 to 1,3	pigsar Nr. 7.54-D:2022-08 Δp: 10 mbar to 2500 mbar Q_V: 40 m³/h to 30000 m³/h	0,24 %	high-pressure natural gas, 8 bar to 65 bar, closed loop part of the test bench, discharge coefficient C determined according to ISO 5167:2003, Δp: differential pressure of pressure differential device

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V.
pigsar Nr. […]	In house method of Vier Gas Services GmbH & Co. KG

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