

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-K-20536-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **03.11.2020**

Date of issue: 03.11.2020

Holder of certificate:

**BD Sensors GmbH**  
**BD-Sensors-Straße 1, 95199 Thierstein, Germany**

Calibration in the fields:

**Mechanical quantities**  
– Pressure

### Permanent Laboratory

Calibration and Measurement Capabilities (CMC)					
Measurement quantity / Calibration item	Range		Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
<b>Pressure</b> Absolute pressure $p_{abs}$	0.1 mbar	to 70 mbar	DIN EN 837: 1997 DKD-R 6-1: 2014 EURAMET Calibration Guide No. 17. Version 3.0 from > 76 bar on calibration method: $p_{abs} = p_e + p_{amb}$	$35 \mu\text{bar} + 2.5 \cdot 10^{-5} \cdot p_{abs}$	Pressure medium: Gas
	> 70 mbar	to 3.8 bar		$2 \mu\text{bar} + 1.5 \cdot 10^{-5} \cdot p_{abs}$	
	> 3.8 bar	to 19 bar		$5 \mu\text{bar} + 1.8 \cdot 10^{-5} \cdot p_{abs}$	From > 70 mbar on the uncertainty of the measured residual pressure has to be taken into account.
	> 19 bar	to 76 bar		$20 \mu\text{bar} + 2.5 \cdot 10^{-5} \cdot p_{abs}$	

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

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.  
<https://www.dakks.de/en/content/accredited-bodies-dakks>*

Annex to the accreditation certificate D-K-20536-01-00

**Permanent Laboratory**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
	> 76 bar to 211 bar	DIN EN 837: 1997 DKD-R 6-1: 2014	$0.12 \text{ mbar} + 2.6 \cdot 10^{-5} \cdot p_{\text{abs}}$	Pressure medium: Gas
	> 211 bar to 801 bar	EURAMET Calibration Guide No. 17, Version 3.0 from > 76 bar on calibration method: $p_{\text{abs}} = p_e + p_{\text{amb}}$	$0.30 \text{ mbar} + 5.3 \cdot 10^{-5} \cdot p_{\text{abs}}$	The uncertainty of the barometer has to be taken into account.
	1 bar; 3 bar to 1001 bar	DIN EN 837: 1997 DKD-R 6-1: 2014 EURAMET Calibration Guide No. 17, Version 3.0 calibration method: $p_{\text{abs}} = p_e + p_{\text{amb}}$	$19 \cdot 10^{-5} \cdot p_{\text{abs}}$ ; but not < 7.5 mbar	Pressure medium: Oil The uncertainty of the barometer has to be taken into account.
Negative and positive gauge pressure $p_e$	-950 mbar to -70 mbar	DIN EN 837: 1997 DKD-R 6-1: 2014 EURAMET Calibration Guide No. 17, Version 3.0 up to -70 mbar calibration method: $-p_e = p_{\text{abs}} - p_{\text{amb}}$	$10 \mu\text{bar} + 2.1 \cdot 10^{-5} \cdot p_e$	Pressure medium: Gas
	> -70 mbar to 70 mbar		$5 \mu\text{bar} + 2 \cdot 10^{-5} \cdot p_e$	
	> 70 mbar to 4 bar		$1 \mu\text{bar} + 1.5 \cdot 10^{-5} \cdot p_e$	Up to -70 mbar the uncertainty of the measured residual pressure and of the barometer have to be taken into account.
	> 4 bar to 20 bar		$3 \mu\text{bar} + 1.8 \cdot 10^{-5} \cdot p_e$	
	> 20 bar to 80 bar		$12 \mu\text{bar} + 2.5 \cdot 10^{-5} \cdot p_e$	
	> 80 bar to 210 bar		$0.07 \text{ mbar} + 2.6 \cdot 10^{-5} \cdot p_e$	
	> 210 bar to 800 bar		$0.30 \text{ mbar} + 5.3 \cdot 10^{-5} \cdot p_e$	
	0 bar; 2 bar to 1000 bar	DIN EN 837: 1997 DKD-R 6-1: 2014 EURAMET Calibration Guide No. 17, Version 3.0	$19 \cdot 10^{-5} \cdot p_{\text{abs}}$ ; but not < 7.5 mbar	Pressure medium: Oil

**Abbreviations used:**

CMC	Calibration and measurement capabilities
DIN	German Institute for Standardization
DKD-R	Calibration Guide of Deutscher Kalibrierdienst (DKD), published by the Physikalisch-Technischen Bundesanstalt
EURAMET	European Association of National Metrology Institutes

<sup>1)</sup> The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 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.

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