

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-K-20838-01-00 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 27.01.2022

Date of issue 27.01.2022

Holder of certificate:

**inotech Meter Calibration Systems GmbH**  
**Obere Hardt 15, 76467 Bietigheim**

Calibration in the fields:

### **Thermodynamic quantities**

#### **Temperature measurements**

- Direct detecting thermometer <sup>a)</sup>

#### **Humidity quantities**

- Measurement equipment for relative humidity <sup>a)</sup>

### **Mechanical quantities**

- Pressure <sup>a)</sup>
- Flow of gases <sup>a)</sup>

### **Electric quantities**

#### **Time and frequency**

- Frequency <sup>a)</sup>

<sup>a)</sup> on site-location-calibration

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

*The certificate together with the annex reflects the status as indicated by the date of issue.*

*The current status of any given scope of accreditation may be found respectively in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH <https://www.dakks.de/en/content/accredited-bodies-dakks>.*

Abbreviations used: see last page

**Page 1 of 3**

**This document is a translation. The definitive version is the original German annex to the accreditation certificate.**

**Annex to the accreditation certificate D-K-20838-01-00**

**Permanent Laboratory**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks	
<b>Temperature quantities</b> Direct reading thermometers with resistance sensors	-40 °C to 80 °C	DKD-R 5-1:2018 In a water bath	0,05 K	Comparison with standard resistance thermometers	
<b>Relative humidity</b> Direct reading electrical Hygrometers	10 % to 70 %	DKD-R 5-8:2019 with temperature-humidity generator Measuring medium air air temperature: 20 °C to 30 °C	2 %	Comparison with capacitive humidity standard	
	> 70 % to 90 %		3 %	Uncertainty expressed as relative humidity	
<b>Pressure</b> Absolut pressure $p_{abs}$	700 mbar to 1100 mbar	DKD-R 6-1:2014	0,15 mbar	Pressure medium: gas	
	Negative and positive gauge pressure $p_e$		-1 bar to < -0,1 bar		0,2 mbar
			- 0,1 bar to 0,1 bar		0,1 mbar
			> 0,1 bar to 1 bar		0,2 mbar
> 1 bar to 100 bar	$1 \cdot 10^{-3} \cdot p_e$				
<b>Flow of gases</b> Volume flow rate $dV/dt$ of flowing gases	2 L/h to < 16 L/h	Standard: critical nozzle, drum gas meter, rotary piston gas meter, turbine gas meter AA-108.005 V. 1.3 AA-108.006 V. 1.4 AA-108.007 V. 1.1 AA-108.008 V. 1.0	0,28 %	Calibration medium atmospheric air Flow rates under operating conditions (from 2650 m <sup>3</sup> /h only systems with flow generation)	
	16 L/h to < 200 L/h		0,20 %		
	0,2 m <sup>3</sup> /h to 6500 m <sup>3</sup> /h		0,18 %		
<b>Frequency</b>	0,1 Hz to 100 kHz	AA-108.004 V. 1.1	$1 \cdot 10^{-6} \cdot f$	$f$ = respective measured value	

<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.

**On-site Calibration**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
<b>Temperature quantities</b> Direct reading thermometers with resistance sensors	-40 °C to 80 °C	DKD-R 5-1:2018 In a water bath	0,05 K	Comparison with standard resistance thermometers
<b>Relative humidity</b> Direct reading electrical Hygrometers	10 % to 70 %	DKD-R 5-8:2019 with temperature-humidity generator Measuring medium air air temperature: 20 °C to 30 °C	2 %	Comparison with capacitive humidity standard Uncertainty expressed as relative humidity
	> 70 % to 90 %		3 %	
<b>Pressure</b> Absolut pressure $p_{abs}$  Negative and positive gauge pressure $p_e$	700 mbar to 1100 mbar	DKD-R 6-1:2014	0,15 mbar	Pressure medium: gas
	-1 bar to < -0,1 bar		0,2 mbar	
	- 0,1 bar to 0,1 bar		0,1 mbar	
	> 0,1 bar to 1 bar		0,2 mbar	
	> 1 bar to 100 bar		$1 \cdot 10^{-3} \cdot p_e$	
<b>Flow of gases</b> Volume flow rate $dV/dt$ of flowing gases	2 L/h to < 16 L/h	Standard: critical nozzle, drum gas meter, rotary piston gas meter, turbine gas meter AA-108.005 V. 1.3 AA-108.006 V. 1.4 AA-108.007 V. 1.1 AA-108.008 V. 1.0	0,28 %	Calibration medium atmospheric air (under laboratory conditions) Flow rates under operating conditions
	16 L/h to < 200 L/h		0,20 %	
	0,2 m <sup>3</sup> /h to 6500 m <sup>3</sup> /h		0,18 %	
<b>Frequency</b>	0,1 Hz to 100 kHz	AA-108.004 V. 1.1	$1 \cdot 10^{-6} \cdot f$	$f$ = respective measured value

**Abbreviations used:**

AA	In house calibration procedure of inotech Meter Calibration Systems GmbH
CMC	Calibration and measurement capabilities
DKD-R	Guideline of Deutscher Kalibrierdienst (DKD), published by Physikalisch-Technischen Bundesanstalt (PTB)

<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.