

# Deutsche Akkreditierungsstelle

## Annex to the Partial Accreditation Certificate D-K-18446-01-01 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 09.02.2023

**Date of issue:** 09.02.2023

This annex is a part of the accreditation certificate D-K-18446-01-00.

Holder of partial accreditation certificate:

**mg-sensor GmbH**  
**Airport Boulevard B210, 77838 Rheinmünster**

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.

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Abbreviations used: see last page

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**Annex to the Partial Accreditation Certificate D-K-18446-01-01**

with further location

**Knorrstraße 147, EG-351, 80788 München**

Calibration in the fields:

**Mechanical quantities**

- **Force**
- **Acceleration**
- **Pressure**

**Thermodynamic quantities**

**Temperature quantities**

- **Resistance thermometers**
- **Direct reading thermometers**
- **Temperature transmitters, data loggers**

**Humidity quantities**

- **Devices for relative humidity**

Within the measurands/calibration items marked with 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.

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**Annex to the Partial Accreditation Certificate D-K-18446-01-01**

**Permanent laboratory, Rheinmünster location**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Force*</b> Force sensors (safety-belt)	500 N to 25 kN	ISO/TS 17242:2014-05	1·10 <sup>-2</sup>	Traction force reference standard measuring device with reference transducer Analogue and digital sensors
Force sensors	2 kN to 20 kN	DKD-R 3-3:2018	2·10 <sup>-3</sup>	Compressive force reference standard measuring device with reference transducer Analogue and digital sensors
Multi-component force and moment Multi-component transducer (ATD)	0.05 kN to < 0.5 kN	KW-F05000:2021	2·10 <sup>-2</sup>	
	0.5 kN to 25 kN		5·10 <sup>-3</sup>	
	3 N·m to < 30 N·m		2·10 <sup>-2</sup>	
Force transducer	30 N·m to 1200 N·m	5·10 <sup>-3</sup>		
Force transducer	0.5 kN to 600 kN		5·10 <sup>-3</sup>	
<b>Angular velocity</b> Angular velocity sensors	150°/s to 3500°/s	KW-AV0002:2021	0.5 %	Rotational via incremental encoder for left and right rotation Analogue and digital sensors
secondary, dynamic	8°/s to 5000°/s	KW-AV0005:2021 1 Hz to 200 Hz	1.5 % / 1.5°	Analogue and digital sensors Calibration result: complex transfer coefficient (analogue: amplitude/phase, digital: amplitude) and indication deviation

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**Annex to the Partial Accreditation Certificate D-K-18446-01-01**

**Permanent laboratory, Rheinmünster location**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Acceleration*</b> Acceleration sensors	200 m/s <sup>2</sup> to 20000 m/s <sup>2</sup>	Shock excitation DKD-R 3-1 page 2:2018	1.2 %	Analogue and digital sensors
	5 m/s <sup>2</sup> to 200 m/s <sup>2</sup>	Sinusoidal excitation DKD-R 3-1 page 3:2018  10 Hz to 5 kHz > 5 kHz to 10 kHz	1.2 % / 1.0 ° 2.5 % / 1.5 °	Analogue and digital sensors Calibration result: complex transfer coefficient (analogue: amplitude/phase, digital: amplitude) and indication deviation
<b>Pressure*</b> Positive pressure	0 bar to 6 bar	DKD-R 6-1:2014	1 %	
Absolute pressure	1 bar to 7 bar	DKD-R 6-1:2014	1 %	
<b>Temperature*</b> Resistance thermometers, direct reading thermometers, temperature transmitters and data loggers with resistance sensor	10 °C to 50 °C	DKD-R 5-1:2018 in temperature / humidity generator	0.15 K	Comparison with display of the temperature / humidity generator
Temperature indicators and simulators for base metal thermocouples	-50 °C to 500 °C	DKD-R 5-5:2018	0.2 K	Characteristic curve according to DIN EN 60584:2014
<b>Relative humidity*</b> Direct reading electric hygrometers, data loggers	10 % to 80 %	DKD-R 5-8:2019 in temperature / humidity generator Measurement in air Air temperature: 20 °C to 25 °C	3 %	Comparison with display of the temperature / humidity generator Measurement uncertainty expressed as absolute value of the relative humidity

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**Permanent laboratory, München location**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Acceleration*</b> Acceleration sensors, accelerometer measurement chains	200 m/s <sup>2</sup> to 2000 m/s <sup>2</sup>	Shock excitation DKD-R 3-1 page 2: 2018	1.5 %	Analogue and digital sensors
<b>Force*</b> Force sensors	2 kN to 20 kN	DKD-R 3-3:2018	2·10 <sup>-3</sup>	Analogue and digital sensors
Multi-component force and moment Multi-component transducer (ATD)	0.05 kN to < 0.5 kN	KW-FO5000:2021	2·10 <sup>-2</sup>	Compressive force reference standard measuring device with reference transducer
	0.5 kN to 25 kN		5·10 <sup>-3</sup>	
	3 N·m to < 30 N·m		2·10 <sup>-2</sup>	
	30 N·m to 1200 N·m		5·10 <sup>-3</sup>	Analogue and digital sensors

**Abbreviations used:**

DKD-R            Richtlinie des Deutschen Kalibrierdienstes (DKD),  
herausgegeben von der Physikalisch-Technischen Bundesanstalt

KW-              calibration procedure of the mg-sensor GmbH

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# Deutsche Akkreditierungsstelle

## Annex to the Partial Accreditation Certificate D-K-18446-01-02 according to DIN EN ISO/IEC 17025:2018

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**mg-sensor GmbH**  
**Airport Boulevard B210, 77838 Rheinmünster**

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.

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Abbreviations used: see last page

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**Annex to the Partial Accreditation Certificate D-K-18446-01-02**

Calibration in the fields:

**Dimensional quantities**

**Length**

- **Length measuring instruments**

**Angle**

- **Angle of rotation**
- **Inclination**

**Electrical quantities**

**DC and low frequency quantities**

- **DC voltage**
- **DC current**

Within the measurands/calibration items marked with 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.

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**Annex to the Partial Accreditation Certificate D-K-18446-01-02**

**Permanent laboratory, Rheinmünster location**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Length*</b> Displacement sensor (ATD))	0 mm to 200 mm	ISO 23521:2020	20 µm	Analogue and digital sensors
chest displacement potentiometer	0 mm to 200 mm	SAE J 2517:2016	20 µm	
IR Tracc displacement	0 mm to 200 mm	ISO/TS 21476:2018	1 %	
<b>Angle</b> Angle of rotation* Direct rotary encoder systems*	0° to 360°	VDI/VDE 2648 page 1:2009	0.3°	Rotation angle sensors Analogue and digital sensors
Inclinometers	-90° to 90°	KW-AN0001:2022	0.3°	Inclination angle sensors Analogue and digital sensors
IR Tracc angle	-45° to 45°	KW-DS0003:2022	1 %	
<b>Electrical quantities</b> DC voltage	0 V to 1000 V		$0.1 \cdot 10^{-3} U + 2 \mu\text{V}$	<i>U</i> : measured value
DC current	0 A		5 nA	<i>I</i> : measured value
	100 µA to 1 A		$0,3 \cdot 10^{-3} I$	
	> 1 A to 1000 A		$2 \cdot 10^{-3} I$	
DC current current clamps	0 A to 1000 A	1 to <i>N</i> windings	$10 \cdot 10^{-3} I + 10 \text{ mA}$	

**Abbreviations used:**

KW- calibration procedure of the mg-sensor GmbH  
VDE Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.  
VDI Verein Deutscher Ingenieure e.V.

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