

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-18446-01-00 according to DIN EN ISO/IEC 17025:2018

 Valid from:
 10.04.2025

 Date of issue:
 10.04.2025

Holder of accreditation certificate:

mg-sensor GmbH Airport Boulevard B210, 77836 Rheinmünster

The calibration laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The calibration laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed in the annexes to the partial accreditation certificates listed below.

D-K-18446-01-01 D-K-18446-01-02

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

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.



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with the locations

mg-sensor GmbH Airport Boulevard B210, 77836 Rheinmünster

mg-sensor GmbH Knorrstraße 147, EG-351, 80788 München

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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.



Permanent laboratory, Rheinmünster location

	Callbr	atic		easurement capab		
Measurement quantity	I	Rang	ge	Measurement	Expanded uncertainty	Remarks
/ Calibration item				conditions / procedure	of measurement	
Force* Force sensors (safety-belt)	500 N	to	25 kN	ISO/TS 17242:2014-05	1.10-2	Traction force reference standard measuring device with reference transducer Analogue and digital sensors
Force sensors	0,5 kN	to	25 kN	DKD-R 3-3:2018	5·10 ⁻³	Compressive force
Multi-component force and	0.1 kN	to	< 0.5 kN	KW-F05000:2024	1.10-2	reference standard measuring device
Multi-component	0.5 kN	to	600 kN		5·10 ⁻³	with reference
transducer (ATD)	2 N·m	to	12000 N·m		5·10 ⁻³	Analogue and digital sensors
Angular velocity 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

Calibration and Measurement Capabilities (CMC)



Permanent laboratory, Rheinmünster location

	Calibr	atio	on and M	easurement Capab	ilities (CMC)	
Measurement quantity / Calibration item		Ran	ge	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Acceleration* Acceleration sensors	200 m/s ²	to	20000 m/s ²	Shock excitation DKD-R 3-1 page 2:2018	1.2 %	Analogue and digital sensors
	5 m/s²	to	200 m/s²	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
Pressure* Positve 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 %	
Temperature* Resistance thermometers, direct reading thermo- meters, 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
Relative humidity [*] 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



Permanent laboratory, München location

	Calibi	atio		easurement capabil		
Measurement quantity / Calibration item		Rang	е	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Acceleration* Acceleration sensors, accelerometer measurement chains	200 m/s²	to	2000 m/s ²	Shock excitation DKD-R 3-1 page 2: 2018	1.5 %	Analogue and digital sensors
Force* Force sensors	2 kN	to	20 kN	DKD-R 3-3:2018	2.10-3	Analogue and digital sensors
Multi-component force and moment Multi-component transducer (ATD)	0.05 kN	to	< 0.5 kN	KW-FO5000:2021	2.10-2	Compressive force
	0.5 kN	to	25 kN		5·10 ⁻³	reference standard measuring device with reference transducer Analogue and digital sensors
	3 N∙m	to	< 30 N∙m	2.10-2	2.10-2	
	30 N∙m	to	1200 N∙m		5·10 ⁻³	

Calibration and Measurement Canabilities (CMC)

Abbreviations used:

DKD-R Richtlinie des Deutschen Kalibrierdienstes (DKD), herausgegeben von der Physikalisch-Technischen Bundesanstalt KWcalibration procedure of the mg-sensor GmbH



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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

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Permanent laboratory, Rheinmünster location

	Calibra	atio	n and N	leasurement Capab	ilities (CMC)	
Measurement quantity	R	lange	2	Measurement	Expanded uncertainty	Remarks
/ Calibration item				conditions / procedure	of measurement	
Length*	0 mm	to	200 mm	ISO 23521:2020	20 µm	Analogue and digital
Displacement sensor (ATD))						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 %	
Angle 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-AN0001:2023-10	0.3°	Inclination angle sensors Analogue and digital sensors
Inclinometers, electronic Inclinometers	-90°	to	90°	CL-PR-0001HD:2024-03	0.2°	TILT-sensors
IR Tracc angle	-45°	to	45°	KW-DS0003:2022	1 %	
Electrical quantities	0 V	to	1000 V		0.1 · 10 ⁻³ <i>U</i> + 2 μV	U: measured value
DC voltage						
DC current			0 A		5 nA	I: measured value
	100 µA	to	1 A		0,3 · 10 ⁻³ /	
	>1A	to	1000 A		2 · 10 ⁻³ /	
DC current current clamps	0 A	to	1000 A	1 to N windings	10 · 10 ⁻³ / + 10 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.



Abbreviations used:

- DIN Deutsches Institut für Normung e.V. German institute for standardization
- EN Europäische Norm European Standard
- IEC International Electrotechnical Commission
- ISO International Organization for Standardisation
- XYZ In house method of the CAB