

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-K-15127-01-00 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 29.07.2022

Date of issue: 29.07.2022

Holder of certificate:

**Kistler Instrumente Gesellschaft mit beschränkter Haftung  
Umberto-Nobile-Str. 14, 71063 Sindelfingen**

with further calibration laboratories

**Hatschekstraße 5/2, 69126 Heidelberg  
Maierhofstraße 35, 73547 Lorch**

Calibration in the fields:

### **Mechanical quantities**

- Force\*
- Pressure\*
- Acceleration\*
- Torque\*

### **Dimensional quantities**

#### **Length**

- Length measuring instruments

Within the measurands / calibration items marked 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.

*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 can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de/en/accredited-bodies-search.html>.*

Abbreviations used: see last page

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

**Annex to the accreditation certificate D-K-15127-01-00**
**Permanent Laboratory, Sindelfingen**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Acceleration</b> Accelerometer, acceleration measurement chains (reference frequencies)	1 m/s <sup>2</sup> to 80 m/s <sup>2</sup>	DKD-R 3-1:2018 Sinusoidal excitation 40 Hz, 80 Hz (APS)	0.8 %	Calibration result: magnitude of the charge transfer coefficient magnitude of the voltage transfer coefficient
	10 m/s <sup>2</sup> to 200 m/s <sup>2</sup>	DKD-R 3-1:2018 Sinusoidal excitation 159.2 Hz, 160 Hz (TIRA)	0.8 %	
Acceleration sensors, acceleration measurement chains ( mid-frequency)	5 m/s <sup>2</sup> to 200 m/s <sup>2</sup>	DKD-R 3-1:2018 Sinusoidal excitation 20 Hz to 1.25 kHz	1 %	
		DKD-R 3-1:2018 Sinusoidal excitation > 1.25 kHz to 5 kHz	2 %	
		DKD-R 3-1:2018 Sinusoidal excitation > 5 kHz to 10 kHz	5 %	
Accelerometer, acceleration measurement chains (low frequency)	0.1 m/s <sup>2</sup> to 80 m/s <sup>2</sup>	DKD-R 3-1:2018 Sinusoidal excitation 0.5 Hz to 20 Hz	0.5 % / 0.9°	Calibration result: Complex charge transfer coefficient Complex voltage transfer coefficient (magnitude / Phase), acceleration
		DKD-R 3-1:2018 Sinusoidal excitation > 20 Hz to 100 Hz	0.8 % / 1.2°	
Vibration calibrators value of acceleration	1 m/s <sup>2</sup> to 20 m/s <sup>2</sup>	DIN ISO 16063-44:2019 10 Hz bis 10 kHz	2 %	
frequency	10 Hz to 160 Hz		0.02 Hz	
	> 160 Hz to < 1 kHz		0.10 Hz	
	1 kHz to < 5 kHz		0.50 Hz	
	5 kHz to < 9 kHz		1.00 Hz	
	9 kHz to 10 kHz		1.50 Hz	
harmonic distortion	10 Hz to 10 kHz	0.05 %		

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**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Voltage Voltage amplifier with grounded input, with differential input, ICP-Amplifier with constant current	70 mV to 30 V	DKD-R 3-2:2019 Sinusoidal excitation 0.1 Hz to < 1 Hz	0.4 % / 0.6°	Calibration result: Transfer coefficient magnitude / phase shift
		DKD-R 3-2:2019 Sinusoidal excitation 1 Hz to 650 Hz	0.2 % / 0.6°	
		DKD-R 3-2:2019 Sinusoidal excitation > 650 Hz to 6.5 kHz	0.3 % / 0.7°	
		DKD-R 3-2:2019 Sinusoidal excitation > 6.5 kHz to 15 kHz	0.4 % / 1.0°	
		DKD-R 3-2:2019 Sinusoidal excitation > 15 kHz to 50 kHz	0.6 % / 5°	
Charge Charge amplifier with grounded input, with differential input	7 pC to 10 nC	DKD-R 3-2:2019 Sinusoidal excitation 0.1 Hz to < 1 Hz	0.4 % / 0.6°	Calibration result: Transfer coefficient magnitude / phase shift
		DKD-R 3-2:2019 Sinusoidal excitation 1 Hz to 650 Hz	0.2 % / 0.6°	
		DKD-R 3-2:2019 Sinusoidal excitation > 650 Hz to 6.5 kHz	0.3 % / 0.7°	
		DKD-R 3-2:2019 Sinusoidal excitation > 6.5 kHz to 15 kHz	0.4 % / 1.0°	
		DKD-R 3-2:2019 Sinusoidal excitation > 15 kHz to 50 kHz	0.6 % / 5°	

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**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Pressure</b> Absolute pressure $p_{abs}$	1 bar	DKD-R 6-1:2014	$7 \cdot 10^{-5} \cdot p_{abs}$ ; but not < 2.2 mbar	Pressure medium: Oil Consider the measurement uncertainty of the barometer
	3 bar to 401 bar			
	> 401 bar to 1401 bar		$8 \cdot 10^{-5} \cdot p_{abs}$	
	0 bar to 20 bar		$1 \cdot 10^{-4} \cdot p_{abs}$ ; but not < 0.8 mbar	
Positive pressure $p_e$	0 bar	DKD-R 3-3:2018	$7 \cdot 10^{-5} \cdot p_e$ ; but not < 2.2 mbar	Pressure medium: Oil
	2 bar to 400 bar			
	> 400 bar to 1400 bar		$8 \cdot 10^{-5} \cdot p_e$	
	0 bar to 20 bar		$1 \cdot 10^{-4} \cdot p_e$ ; but not < 0.8 mbar	Pressure medium: Gas (Nitrogen)
<b>Force</b> Force transducer	2 kN to 20 kN	DKD-R 3-3:2018	0.2 %	Force reference standard measuring device with reference force transducer in compressive force
<b>Length</b> Displacement sensor	0 mm to 200 mm	CD30037:2021	25 $\mu$ m	Analog and digital sensors
	> 200 mm to 600 mm		50 $\mu$ m	

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**Permanent Laboratory, Heidelberg**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Acceleration</b> Accelerometer, acceleration measurement chains	200 m/s <sup>2</sup> to 2000 m/s <sup>2</sup>	Shock excitation DKD-R 3-1 Sheet 2: 2019	1.2 %	Analog and digital sensors
<b>Force</b> Force transducer	0.5 kN to 50 kN	DKD-R 3-3: 2018	0.5 %	Compressive force reference standard measuring device with reference transducer
<b>Multi-component force and torque</b>  Multi-component transducer (ATD)	0.5 kN to 50 kN  2 N·m to 1400 N·m	CD30030-DE:2020-02	0.5 %  0.5 %	Analog and digital sensors
<b>Length</b> Displacement sensor	0 mm to 200 mm > 200 mm to 600 mm	CD30037:2021	25 µm 25 µm	Analog and digital sensors

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**Permanent Laboratory, Lorch**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Torque</b> Torque transducer and torque measurement chains	0.004 N·m to 0.01 N·m	DIN 51309:2005	$2 \cdot 10^{-3}$	20 N·m DM-BNME Range 1
	> 0.01 N·m to < 0.1 N·m		$4 \cdot 10^{-4}$	20 N·m DM-BNME Range 2
	0.1 N·m to 20 N·m		$2 \cdot 10^{-4}$	20 N·m DM-BNME Range 3
	1 N·m to 10 N·m		$1 \cdot 10^{-3}$	3 kN·m DM-BNME
	> 10 N·m to 3 kN·m		$2 \cdot 10^{-4}$	
	1 N·m to 5 N·m		$1 \cdot 10^{-3}$	5 kN·m DM-BNME
	> 5 N·m to 10 N·m		$5 \cdot 10^{-4}$	
	> 10 N·m to 20 N·m		$2 \cdot 10^{-4}$	
	> 20 N·m to 5 kN·m		$1 \cdot 10^{-4}$	
	1 kN·m to 20 kN·m		$5 \cdot 10^{-4}$	100 kN·m DM-BNME
	> 20 kN·m to 100 kN·m		$1 \cdot 10^{-3}$	

**Abbreviations used:**

- ATD Antropomorphic Test Device (Dummy)
- CD300xxx calibration procedure of Kistler Instrumente GmbH
- CMC Calibration and measurement capabilities
- DKD-R Guidline of German Calibration Service (DKD), published by Physikalisch-Technische Bundesanstalt

## List of flexible scope of accreditation

Laboratory: D-K-15127-01-00

Status: 05 Dec 2022

Measurement quantity	Procedure and Version
Acceleration (Sinusoidal excitation)	DKD-R 3-1:2020
Acceleration (Shock excitation)	DKD-R 3-1 Blatt 2: 2019
Acceleration (FVC: Vibration calibrators)	DIN ISO 16063-44: 2019
Acceleration: Amplifier (Voltage and Charge)	DKD-R 3-2:2019
Torque	DIN 51309:2022
Pressure	DKD-R 6-1:2014
Force (Force transducer)	DKD-R 3-3:2018