DAkkS
Deutsche
Akkreditierungsstelle

# Accreditation

The Deutsche Akkreditierungsstelle attests with this **Accreditation Certificate** that

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

with its calibration laboratory

**Maierhofstraße 35, 73547 Lorch**
**Brunhamstraße 21, 81249 München**

meets the requirements of DIN EN ISO/IEC 17025:2018 for the conformity assessment activities specified in the following partial accreditation certificates. This includes additional existing legal and normative requirements for the calibration laboratory, including those in relevant sectoral schemes, provided that these are explicitly confirmed in the annexes to the partial accreditation certificates listed below.

**D-K-15127-01-01**

**D-K-15127-01-02**

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

This accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This accreditation certificate consists of this cover sheet, the reverse side of the cover sheet and the following annex. It only applies in connection with the partial accreditation certificates listed above and the notices referred to there.

Registration number of the certificate: **D-K-15127-01-00**

Berlin, 04.05.2023 Dipl.-Ing. Gabriel Zrenner
Head of Department

Translation issued:
04.09.2023 Dipl.-Ing. Gabriel Zrenner
Head of Department

*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 (www.dakks.de).*

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

See notes overleaf

# Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Europa-Allee 52
60327 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

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Pursuant to Art. 11 section 2 of Regulation (EC) 765/2008, the accreditation certificate shall be recognised as equivalent by the national authorities within the scope of this Regulation as well as by the WTO member states that have committed themselves in bilateral or multilateral mutual agreements to recognise the certificates of accreditation bodies that are members of ILAC or IAF as equivalent.

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ILAC: www.ilac.org
IAF: www.iaf.nu

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# Deutsche Akkreditierungsstelle

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

**Valid from:** **04.05.2023**

Date of issue: 04.05.2023

Holder of accreditation certificate:

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

with its calibration laboratory

**Maierhofstraße 35, 73547 Lorch**
**Brunhamstraße 21, 81249 München**

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-15127-01-01**

**D-K-15127-01-02**

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

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# Accreditation

The Deutsche Akkreditierungsstelle attests with this **Partial Accreditation Certificate** that the calibration laboratory

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

meets the requirements according to DIN EN ISO/IEC 17025:2018 for the conformity assessment activities listed in the annex to this certificate. This includes additional existing legal and normative requirements for the calibration laboratory, including those in relevant sectoral schemes, provided they are explicitly confirmed in the annex to this certificate.

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 accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This partial accreditation certificate only applies in connection with the notice of 08.02.2024 with accreditation number D-K-15127-01.
It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 7 pages.

Registration number of the partial accreditation certificate: **D-K-15127-01-01**
It is a part of the accreditation certificate: D-K-15127-01-00.

in Vertretung Klaus Umbach

Berlin, 08.02.2024 Dipl.-Wirtsch.-Ing. (BA) Tim Harnisch
Head of Technical Unit

Translation issued:
08.02.2024 Dipl.-Wirtsch.-Ing. (BA) Tim Harnisch
Head of Technical Unit

*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 (www.dakks.de).*

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

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# Deutsche Akkreditierungsstelle

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

**Valid from:** **08.02.2024**

Date of issue: 08.02.2024

This annex is a part of the accreditation certificate D-K-15127-01-00.

Holder of partial accreditation certificate:

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

with the locations

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

**Kistler Instrumente Gesellschaft mit beschränkter Haftung**
**Maierhofstraße 35, 73547 Lorch**

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 below.

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.

Calibration in the fields:

**Mechanical quantities**

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

**Material testing machines (MTM)**

- **Force (MTM)** [a)]

[a)] only on-site calibrations

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.

DAkkS Deutsche Akkreditierungsstelle

## Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | | | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|---|---|
| **Acceleration *** Acceleration sensors, Acceleration measuring chains (reference frequency) | 1 m/s² | to | 80 m/s² | DKD-R 3-1:2018 Sinusoidal excitation 40 Hz, 80 Hz (APS) | 0.8 % | Calibration result: amount of charge transfer coefficient or voltage transfer coefficient, Acceleration |
| | 10 m/s² | to | 200 m/s² | DKD-R 3-1:2018 Sinusoidal excitation 159.2 Hz, 160 Hz (TIRA) | 0.8 % | |
| Acceleration sensors, Acceleration measuring chains (intermediate frequency range) | 5 m/s² | to | 200 m/s² | 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 % | |
| Acceleration sensors, Acceleration measuring chains (low frequency range) | 0.1 m/s² | to | 80 m/s² | DKD-R 3-1:2018 Sinusoidal excitation 0.5 Hz to 20 Hz | 0.5 % / 0.9° | Calibration result: complex transfer coefficient or voltage transfer coefficient (amplitude / phase), Acceleration |
| | | | | DKD-R 3-1:2018 Sinusoidal excitation > 20 Hz to 100 Hz | 0.8 % / 1.2° | |
| Vibration calibrator Amount of acceleration | 1 m/s² | to | 20 m/s² | DIN ISO 16063-44:2019 10 Hz to 10 kHz | 2 % | |
| Fequency | 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 | |
| Distortion | 10 Hz | to | 10 kHz | | 0.05 % | |

## Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|
| Voltage<br>Voltage measuring amplifier with grounded incoming, with difference incoming,<br>ICP- measuring amplifier with constant current supply | 70 mV to 30 V | DKD-R 3-2:2019<br>Sinusoidal excitation<br>0.1 Hz to < 1 Hz | 0.4 % / 0.6° | Calibration result:<br>transfer coefficient amount / phase shift |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>1 Hz to 650 Hz | 0.2 % / 0.6° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 650 Hz to 6.5 kHz | 0.3 % / 0.7° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 6.5 kHz to 15 kHz | 0.4 % / 1.0° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 15 kHz to 50 kHz | 0.6 % / 5° | |
| Charge<br>Charge amplifier with grounded incoming, with difference incoming | 7 pC to 10 nC | DKD-R 3-2:2019<br>Sinusoidal excitation<br>0.1 Hz to < 1 Hz | 0.4 % / 0.6° | Calibration result:<br>transfer coefficient amount / phase shift |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>1 Hz to 650 Hz | 0.2 % / 0.6° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 650 Hz to 6.5 kHz | 0.3 % / 0.7° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 6.5 kHz to 15 kHz | 0.4 % / 1.0° | |
| | | DKD-R 3-2:2019<br>Sinusoidal excitation<br>> 15 kHz to 50 kHz | 0.6 % / 5° | |
| **Pressure ***<br>Absolute pressure $p_{abs}$ | 1 bar | DKD-R 6-1:2014 | $7 \cdot 10^{-5} \cdot p_{abs}$;<br>but not < 2.2 mbar | pressure medium: oil<br>uncertainty of measurement of barometer must be considered |
| | 3 bar to 401 bar | | | |
| | > 401 bar to 1401 bar | | $8 \cdot 10^{-5} \cdot p_{abs}$ | |
| | 0 bar to 20 bar | | $1 \cdot 10^{-4} \cdot p_{abs}$;<br>but not < 0.8 mbar | pressure medium: gas (nitrogen) |
| Positive pressure $p_e$ | 0 bar | | $7 \cdot 10^{-5} \cdot p_e$;<br>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 | | $1 \cdot 10^{-4} \cdot p_e$;<br>but not < 0.8 mbar | pressure medium: gas (nitrogen) |

## Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | | | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|---|---|
| **Force**<br>Force sensors * | 2 kN | to | 20 kN | DKD-R 3-3:2018 | 0.2 % | force-reference measurement device with reference force transducer in compressive force |
| Multi-component force and moment<br>Multi-component transducer | 2 kN | to | 50 kN | CD30036-DE:2022 | 0.25 %; but not < 12.0 N | hexapods-calibration device |
| | 0.1 kN·m | to | 10 kN·m | | 0.35 %; but not < 1.0 N·m | |
| | 2 kN | to | 50 kN | CD30036-DE:2022 | 0.40 %; but not < 12.0 N | measuring wheels and multi-component sensors |
| | 0.1 kN·m | to | 10 kN·m | | 0.50 %; but not < 1.2 N·m | |

**Permanent laboratory, Lorch location**

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | | | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|---|---|
| **Torque *** Torque transducer and Torque measuring chains | 0.004 N·m | to | 0.01 N·m | DIN 51309:2022 | $2 \cdot 10^{-3}$ | 20 N·m DM-BNME |
| | > 0.01 N·m | to | < 0.1 N·m | | $4 \cdot 10^{-4}$ | |
| | 0.1 N·m | to | 20 N·m | | $2 \cdot 10^{-4}$ | |
| | 0.1 N·m | to | < 0.2 N·m | | $6 \cdot 10^{-4}$ | 200 N·m DM-BNME |
| | 0.2 N·m | to | < 0.4 N·m | | $4 \cdot 10^{-4}$ | |
| | 0.4 N·m | to | < 1 N·m | | $2 \cdot 10^{-4}$ | |
| | 1 N·m | to | 200 N·m | | $1 \cdot 10^{-4}$ | |
| | 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 | | $1 \cdot 10^{-3}$ | |

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## On-site Calibration

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | | | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|---|---|
| **Force (MTM)** Force measuring device for devices not compliant with DIN 51220 | 0.5 kN | to | 15 kN | CD30038-DE:2023 continuous loading | 0.40 % | Devices such as joining systems. In compression direction |
| | > 15 kN | to | 300 kN | | 0.35 % | |

**Abbreviations used:**

| | |
|---|---|
| CD300xxx | In house method of the Kistler Instrumente GmbH |
| CMC | Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten) |
| DKD-R | Richtlinie des Deutschen Kalibrierdienstes (DKD), herausgegeben von der Physikalisch-Technischen Bundesanstalt |

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**Umberto-Nobile-Str. 14, 71063 Sindelfingen**

with its calibration laboratory

**Maierhofstraße 35, 73547 Lorch**

meets the requirements according to DIN EN ISO/IEC 17025:2018 for the conformity assessment activities listed in the annex to this certificate. This includes additional existing legal and normative requirements for the calibration laboratory, including those in relevant sectoral schemes, provided they are explicitly confirmed in the annex to this certificate.

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This partial accreditation certificate only applies in connection with the notices of 04.05.2023 with accreditation number D-K-15127-01.
It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 4 pages.

Registration number of the partial accreditation certificate: **D-K-15127-01-02**
It is a part of the accreditation certificate D-K-15127-01-00.

Berlin, 04.05.2023 Dipl.-Ing. Gabriel Zrenner
Head of Department

Translation issued:
04.09.2023 Dipl.-Ing. Gabriel Zrenner
Head of Department

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# Deutsche Akkreditierungsstelle

# Annex to the Accreditation Certificate D-K-15127-01-02 according to DIN EN ISO/IEC 17025:2018

**Valid from:** **04.05.2023**

Date of issue: 04.05.2023

Holder of accreditation certificate:

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

with its calibration laboratory

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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 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.

**Dimensional quantities**

**Length**
- **Length measuring instruments**

**Electrical quantities**

**DC and low frequency quantities**
- **DC voltage**
- **DC current**
- **DC resistance**

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## Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|
| **Length**<br>Displacement sensors | 0 mm to 200 mm | CD30037:2023-01 | 25 µm | Analogue and digital sensors |
| | > 200 mm to 600 mm | | 50 µm | |
| | > 600 mm to 850 mm | | 90 µm | |

## Permanent laboratory, München location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|
| **DC voltage**<br>DC voltage source | 0 V to 1 mV | | 4.6 µV | direct measurement |
| | > 1 mV to 10 mV | | 5.3 µV | |
| | > 10 mV to 100 mV | | 11 µV | |
| | > 100 mV to 1 V | | 44 µV | |
| | > 1 V to 10 V | | 0.41 mV | |
| | > 10 V to 20 V | | 1.7 mV | |
| | > 20 V to 100 V | | 6.0 mV | |
| | > 100 V to 1000 V | | 60 mV | |

## Permanent laboratory, München location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|
| **DC voltage** measuring devices | 0 V to 450 µV | | 0.62 µV | |
| | >450 µV to 3 mV | | 1.1 µV | |
| | >3 mV to 4.5 mV | | 1.6 µV | |
| | >4.5 mV to 10 mV | | 3.9 µV | |
| | >10 mV to 30 mV | | 4.9 µV | |
| | >30 mV to 45 mV | | 5.6 µV | |
| | >45 mV to 300 mV | | 25 µV | |
| | >300 mV to 450 m V | | 41 µV | |
| | >450 mV to 3 V | | 0.25 mV | |
| | >3 V to 4.5 V | | 0.43 mV | |
| | >4.5 V to 30 V | | 2.5 mV | |
| **DC current** Source | 0 A to 100 µA | | 1.0 µA | |
| | >100 µA to 1 mA | | 1.6 µA | |
| | >1 mA to 10 mA | | 7.2 µA | |
| | >10 mA to 100 mA | | 0.16 mA | |
| | >100 mA to 1 A | | 1.1 mA | |
| | >1 A to 3 A | | 4.5 mA | |
| | 1 mA to 20 mA | | $1.5 \cdot 10^{-4}$ | |

## Permanent laboratory, München location

Calibration and Measurement Capabilities (CMC)

| Measurement quantity / Calibration item | Range | | | Measurement conditions / procedure | Expanded uncertainty of measurement | Remarks |
|---|---|---|---|---|---|---|
| **DC resistance** Resistance | 0 Ω | to | 100 mΩ | | 0.10 mΩ | |
| | >100 mΩ | to | 1 Ω | | 0.14 mΩ | |
| | >1 Ω | to | 10 Ω | | 0.77 mΩ | |
| | >10 Ω | to | 100 Ω | | 7.6 mΩ | |
| | >100 Ω | to | 250 Ω | | 21 mΩ | |
| | >250 Ω | to | 660 Ω | | 51 mΩ | |
| | >660 Ω | to | 1 kΩ | | 76 mΩ | |
| | >1 kΩ | to | 10 kΩ | | 0.76 Ω | |
| | >10 kΩ | to | 100 kΩ | | 9.1 Ω | |
| | >100 kΩ | to | 1 MΩ | | 91 Ω | |

**Abbreviations used:**

| | |
|---|---|
| CD300xxx | In house method of the Kistler Instrumente GmbH |
| CMC | Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten) |

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measure. analyze. innovate.

# List of flexible procedures in the accredited area

This list documents the currently used version of the calibration guidelines for the flexible accredited calibration procedures.

## Laboratory: D-K-15127-01-00
## Status: 08 March 2024

| 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 3-3:2024 |