

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the calibration laboratory

Hottinger Brüel & Kjaer GmbH
Im Tiefen See 45, 64293 Darmstadt

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out calibrations in the following fields:

Mechanical quantities

- Torque
- Force
- Pressure

Thermodynamic quantities

- Temperature quantities
- Temperature indicators and simulators ^{a)}

Electrical quantities

- DC and low frequency quantities
- Voltage ratio ^{a)}
- DC voltage ^{a)}
- DC current ^{a)}
- DC resistance ^{a)}

Time and frequency

- Frequency ^{a)}

^{a)} also on-site calibration

The accreditation certificate shall only apply in connection with the notice of accreditation of 17.06.2022 with the accreditation number D-K-12029-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 9 pages.

Registration number of the certificate: **D-K-12029-01-00**

Berlin,
17.06.2022

Dipl.-Ing. Gabriel Zrenner
Head of Department

Translation issued:
30.06.2022



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 at <https://www.dakks.de/en/accredited-bodies-search.html>.

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

See notes overleaf.

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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

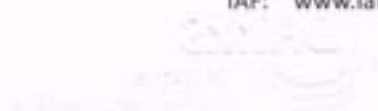
The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:

EA: www.european-accreditation.org

ILAC: www.ilac.org

IAF: www.iaf.nu



Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-12029-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.06.2022

Date of issue: 17.06.2022

Holder of certificate:

**Hottinger Brüel & Kjaer GmbH
Im Tiefen See 45, 64293 Darmstadt**

Calibration in the fields:

Mechanical quantities

- Torque^{*)}
- Force^{*)}
- Pressure^{*)}

Thermodynamic quantities

Temperature quantities

- Temperature indicators and simulators^{a)*)}

Electrical quantities

DC and low frequency

- Voltage ratio^{a)}
- DC voltage^{a)}
- DC current^{a)}
- DC resistance^{a)}

Time and frequency

- Frequency^{a)}

^{a)} also On-site calibration

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.

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-12029-01-00

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Torque^{*)} torque transducer and torque measurement chain	2 N·m to 200 N·m	DIN 51309:2005 DKD-R 10-5:2020 VDI/VDE 2646:2019	$4 \cdot 10^{-4}$	200-N·m-T-RCM, correction 1.00025 right- and left hand torque
	5 N·m to 1000 N·m		$1 \cdot 10^{-4}$	1-kN·m- T-RCM
	5 N·m to 25 kN·m		$2 \cdot 10^{-4}$	Torque-reference RCM
	50 N·m to 200 N·m		$4 \cdot 10^{-4}$	20-kN·m- T-RCM
	250 N·m to 20 kN·m		$2 \cdot 10^{-4}$	
	100 N·m to 20 kN·m		$0.8 \cdot 10^{-4}$	25-kN·m- T-RCM
	> 20 kN·m to 25 kN·m		$1 \cdot 10^{-4}$	
	3 kN·m to 400 kN·m	DIN 51309:2005 VDI/VDE 2646:2019	$1 \cdot 10^{-3}$	400-kN·m- T-RCM
Force^{*)}	2.5 N to 200 N	DIN EN ISO 376:2011 DKD-R 3-3:2010	$5 \cdot 10^{-5}$	200-N-F-RCM compression force
			$8 \cdot 10^{-5}$	200-N- F-RCM tractive force
	50 N to 2.5 kN		$5 \cdot 10^{-5}$	2.5-kN- F-RCM compression force
			$8 \cdot 10^{-5}$	2.5-kN- F-RCM tractive force
	1 kN to 20 kN		$2 \cdot 10^{-4}$	20-kN- F-RCM tractive and compression force
	500 N to 25 kN		$5 \cdot 10^{-5}$	25-kN- F-RCM compression force
			$8 \cdot 10^{-5}$	25-kN- F-RCM tractive force
	5 kN to 100 kN		$2 \cdot 10^{-4}$	100-kN- F-RCM tractive and compression force
	5 kN to 240 kN		$1 \cdot 10^{-4}$	240-kN- F-RCM tractive and compression force
	50 kN to 1 MN		$1 \cdot 10^{-4}$	1-MN- F-RCM compression force
	50 kN to 600 kN		$2 \cdot 10^{-4}$	1-MN- F-RCM tractive force
	100 kN to 5 MN		$2 \cdot 10^{-4}$	5-MN- F-RCM tractive and compression force
50 N to 240 kN	$2 \cdot 10^{-4}$	Force-reference RCM tractive and compression force		
Pressure^{*)} positive pressure p_e	0 bar; 50 bar to 3600 bar	DKD-R 6-1:2014	$2 \cdot 10^{-4} \cdot p_e$; but not < 72 mbar	pressure medium: Oil

Annex to the accreditation certificate D-K-12029-01-00

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Frequency measuring devices	200 Hz to 2000 kHz		$12 \cdot 10^{-6} \cdot f$	<i>f</i> : actual measured value
Temperature*) display devices for resistance thermometer PT 100	-100 °C to 200 °C	DKD-R 5-5:2018	0.025 K	sensor signal by electrical simulation characteristic according to DIN EN 60751:2009
	> 200 °C to 500 °C		0.04 K	
	> 500 °C to 800 °C		0.05 K	
display devices for resistance thermometer PT 500	-100 °C to 200 °C		0.025 K	
	> 200 °C to 500 °C		0.075 K	
	> 500 °C to 800 °C		0.18 K	
display devices for resistance thermometer PT 1000	-100 °C to 200 °C		0.035 K	
	> 200 °C to 500 °C		0.18 K	
	> 500 °C to 800 °C		0.24 K	
display devices for thermocouples type K	-100 °C to 800 °C		0.12 K	
	> 800 °C to 1300 °C		0.3 K	
Anzeigergeräte für Thermoelemente type T	-200 °C to 400 °C			
DC voltage measuring devices	0 V		1 µV	<i>U</i> : actual measured value
	0.001 V to 0.22 V		$7 \cdot 10^{-6} \cdot U + 2 \mu\text{V}$	
	> 0.22 V to 2.2 V		$8 \cdot 10^{-6} \cdot U + 2 \mu\text{V}$	
	> 2.2 V to 11 V		$8 \cdot 10^{-6} \cdot U + 4 \mu\text{V}$	
	> 11 V to 22 V		$9 \cdot 10^{-6} \cdot U + 10 \mu\text{V}$	
	> 22 V to 220 V		$30 \cdot 10^{-6} \cdot U + 40 \mu\text{V}$	
sources	0.0 V to 0.1 V		$6 \cdot 10^{-6} \cdot U + 0.4 \mu\text{V}$	<i>U</i> : actual measured value
	> 0.1 V to 1 V		$5 \cdot 10^{-6} \cdot U + 0.4 \mu\text{V}$	
	> 1 V to 10 V		$5 \cdot 10^{-6} \cdot U + 0.4 \mu\text{V}$	
	> 10 V to 100 V		$50 \cdot 10^{-6} \cdot U + 1\,000 \mu\text{V}$	
DC current measuring devices	0.001 A to 0.022 A		$50 \cdot 10^{-6} \cdot I + 0.3 \mu\text{A}$	<i>I</i> : actual measured value
	> 0.022 A to 0.22 A		$60 \cdot 10^{-6} \cdot I + 2 \mu\text{A}$	

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks		
DC resistance measuring devices	16 Ω to 400 Ω		$40 \cdot 10^{-6} \cdot R + 3.5 \text{ m}\Omega$	R: actual measured value		
	> 400 Ω to 2 000 Ω		$60 \cdot 10^{-6} \cdot R$			
	> 2 000 Ω to 10 000 Ω		$170 \cdot 10^{-6} \cdot R$			
resistance	0.1 Ω to 10 Ω		$18 \cdot 10^{-6} \cdot R + 0.05 \text{ m}\Omega$			
	> 10 Ω to 100 Ω		$15 \cdot 10^{-6} \cdot R + 0.5 \text{ m}\Omega$			
	> 100 Ω to 1000 Ω		$12 \cdot 10^{-6} \cdot R + 5 \text{ m}\Omega$			
	> 1000 Ω to 10000 Ω		$12 \cdot 10^{-6} \cdot R + 50 \text{ m}\Omega$			
Voltage ratio bridge calibration unit	0 mV/V	DC voltage bridge voltage: 1.0 V	0.2 μV/V	calibration in any points between negativ und positiv value within the specified measuring range		
	± 2 mV/V		0.25 μV/V			
	± 5 mV/V		0.3 μV/V			
	± 10 mV/V		0.3 μV/V			
	± 20 mV/V		0.4 μV/V			
	± 100 mV/V		1 μV/V			
	± 1 000 mV/V		10 μV/V			
	0 mV/V	DC voltage bridge voltage: > 1 V to 2.5 V	0.1 μV/V			
	± 2 mV/V		0.1 μV/V			
	± 5 mV/V		0.2 μV/V			
	± 10 mV/V		0.2 μV/V			
	± 20 mV/V		0.2 μV/V			
	± 100 mV/V		1 μV/V			
	± 1 000 mV/V		10 μV/V			
	0 mV/V	DC voltage bridge voltage: > 2.5 V to 7.5 V	0.1 μV/V			
	± 2 mV/V		0.1 μV/V			
	± 5 mV/V		0.1 μV/V			
	± 10 mV/V		0.1 μV/V			
	± 20 mV/V		0.2 μV/V			
	± 100 mV/V		1 μV/V			
	± 1 000 mV/V		10 μV/V			
	Voltage ratio bridge calibration unit	0 mV/V	DC voltage bridge voltage: > 7.5 V to 10 V		0.1 μV/V	calibration in any points between negativ und positiv value with the specified measuring range
		± 2 mV/V			0.1 μV/V	
		± 5 mV/V			0.1 μV/V	
± 10 mV/V		0.1 μV/V				
± 20 mV/V		0.2 μV/V				
± 100 mV/V		1 μV/V				
± 200 mV/V		2 μV/V				

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Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Voltage ratio measuring devices	± 2 mV/V	DC voltage bridge voltage: 1.0 V	0.5 µV/V	calibration in any points between negativ und positiv value with the specified measuring range
	± 5 mV/V		0.5 µV/V	
	± 10 mV/V		1.0 µV/V	
	± 20 mV/V		1.5 µV/V	
	± 100 mV/V		15 µV/V	
	± 1 000 mV/V		150 µV/V	
	± 2 mV/V	DC voltage bridge voltage: > 1 V to 10 V	0.3 µV/V	
	± 5 mV/V		0.6 µV/V	
	± 10 mV/V		1.2 µV/V	
	± 20 mV/V		2.4 µV/V	
	± 100 mV/V		12 µV/V	
	± 1 000 mV/V		120 µV/V	
	± 2 mV/V	measuring frequency: 600 Hz to 1250 Hz square- bridge voltage: 1 V	0.5 µV/V	
	± 5 mV/V		0.5 µV/V	
	± 10 mV/V		1 µV/V	
	± 20 mV/V		1.5 µV/V	
	± 100 mV/V		15 µV/V	
	± 2 mV/V	measuring frequency: 600 Hz to 1250 Hz square- bridge voltage: > 1 V to 5 V	0.3 µV/V	
	± 5 mV/V		0.6 µV/V	
	± 10 mV/V		1.2 µV/V	
± 20 mV/V	2.4 µV/V			
± 100 mV/V	2.4 µV/V			
Voltage ratio quarter and half bridge, measuring devices	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square- bridge voltage:1.0 V	1 µV/V	calibration in any points between negativ und positiv value with the specified measuring range
	± 5 mV/V		2 µV/V	
	± 10 mV/V		2 µV/V	
	± 20 mV/V		5 µV/V	
	± 100 mV/V		20 µV/V	
	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square- bridge voltage: > 1 V to 2.5 V	1 µV/V	
	± 5 mV/V		2 µV/V	
	± 10 mV/V		2 µV/V	
	± 20 mV/V		5 µV/V	
	± 100 mV/V		20 µV/V	
	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square- bridge voltage: > 2.5 V to 5.0 V	1 µV/V	
	± 5 mV/V		2 µV/V	
	± 10 mV/V		2 µV/V	

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Voltage ratio 350 Ω – bridge calibration unit and display devices	0 mV/V ± 0.5 mV/V ± 1 mV/V ± 2 mV/V ± 5 mV/V ± 10 mV/V	DC voltage bridge voltage: 5 V oder 10 V	0.2 μV/V 0.2 μV/V 0.2 μV/V 0.2 μV/V 1·10 ⁻⁴ · measured value 1·10 ⁻⁴ · measured value	resistive reference standard calibration in any points between negativ und positiv value with the specified measuring range
	± 2.5 mV/V ± 5 mV/V	measuring frequency 225 Hz bridge voltage:2.5 V	0.03 μV/V 0.04 μV/V	inductive bridge reference standard calibration in any points between negativ und positiv value with the specified measuring range
	± 2.5 mV/V ± 5 mV/V	measuring frequency 225 Hz bridge voltage: 5 V	0.02 μV/V 0.03 μV/V	
	± 2.5 mV/V	measuring frequency 225 Hz bridge voltage: 10 V	0.02 μV/V	
	± 2.5 mV/V ± 5 mV/V ± 10 mV/V	measuring frequency 600 Hz bridge voltage 1 V	0.2 μV/V 0.2 μV/V 0.3 μV/V	
	± 2.5 mV/V ± 5 mV/V ± 10 mV/V	measuring frequency 600 Hz bridge voltage 2.5 V	0.06 μV/V 0.08 μV/V 0.2 μV/V	
	± 2.5 mV/V ± 5 mV/V ± 10 mV/V	measuring frequency 600 Hz bridge voltage 5 V	0.03 μV/V 0.06 μV/V 0.2 μV/V	
	± 2 mV/V ± 10 mV/V ± 100 mV/V ± 1000 mV/V	measuring frequency 4.8 kHz bridge voltage 1 V	0.4 μV/V 1.5 μV/V 10 μV/V 50 μV/V	resistive reference standard calibration in any points between negativ und positiv value with the specified measuring range
	± 2 mV/V ± 5 mV/V ± 10 mV/V ± 100 mV/V ± 1000 mV/V	measuring frequency 4.8 kHz bridge voltage 2.5 V	0.3 μV/V 0.6 μV/V 1.5 μV/V 10 μV/V 50 μV/V	
	± 2 mV/V ± 5 mV/V ± 10 mV/V ± 100 mV/V	measuring frequency 4.8 kHz bridge voltage 5 V	0.25 μV/V 0.6 μV/V 1.5 μV/V 10 μV/V	

Annex to the accreditation certificate D-K-12029-01-00

On-site calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Frequency measuring devices	200 Hz to 2000 kHz		$12 \cdot 10^{-6} \cdot f$	<i>f</i> : actual measured value
Temperatur^{*)} display devices for resistance thermometer PT 100	-100 °C to 200 °C	DKD-R 5-5:2018	0.025 K	sensor signal by electrical simulation characteristic according to DIN EN 60751:2009
	> 200 °C to 500 °C		0.04 K	
	> 500 °C to 800 °C		0.05 K	
display devices for resistance thermometer PT 500	-100 °C to 200 °C		0.025 K	
	> 200 °C to 500 °C		0.075K	
	> 500 °C to 800 °C		0.18 K	
display devices for resistance thermometer PT 1000	-100 °C to 200 °C		0.035 K	
	> 200 °C to 500 °C		0.18 K	
	> 500 °C to 800 °C		0.24 K	
display devices for thermocouples type K	-100 °C to 800 °C		0.12 K	
	> 800 °C to 1 300 °C	0.3 K		
display devices for thermocouples type T	-200 °C to 400 °C		0.12 K	
DC voltage measuring devices	0 V to 0.045 V		$30 \cdot 10^{-6} \cdot U + 4 \mu\text{V}$	<i>U</i> : actual measured value
	> 0.045 V to 0.3 V		$35 \cdot 10^{-6} \cdot U + 13 \mu\text{V}$	
	> 0.3 V to 0.45 V		$35 \cdot 10^{-6} \cdot U + 22 \mu\text{V}$	
	> 0.45 V to 3 V		$35 \cdot 10^{-6} \cdot U + 125 \mu\text{V}$	
	> 3 V to 4.5 V		$35 \cdot 10^{-6} \cdot U + 215 \mu\text{V}$	
	> 4.5 V to 30 V		$35 \cdot 10^{-6} \cdot U + 1\,300 \mu\text{V}$	
	> 30 V to 60 V		$35 \cdot 10^{-6} \cdot U + 2\,500 \mu\text{V}$	
sources	0.001 V to 0.1 V		$35 \cdot 10^{-6} \cdot U + 8 \mu\text{V}$	<i>U</i> : actual measured value
	> 0.1 V to 1 V		$35 \cdot 10^{-6} \cdot U + 11 \mu\text{V}$	
	> 1 V to 10 V		$35 \cdot 10^{-6} \cdot U + 60 \mu\text{V}$	
	> 10 V to 100 V		$50 \cdot 10^{-6} \cdot U + 1\,000 \mu\text{V}$	

Annex to the accreditation certificate D-K-12029-01-00

On-site calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
DC current measuring devices	0.002 A to 0.0075 A		$90 \cdot 10^{-6} \cdot I + 0.9 \mu\text{A}$	I: actual measured value
	> 0.0075 A to 0.052 A		$90 \cdot 10^{-6} \cdot I + 4 \mu\text{A}$	
DC resistance measuring devices	16 Ω to 400 Ω		$40 \cdot 10^{-6} \cdot R + 3.5 \text{ m}\Omega$	R: actual measured value
	> 400 Ω to 2 000 Ω		$60 \cdot 10^{-6} \cdot R$	
	> 2 000 Ω to 10 000 Ω		$170 \cdot 10^{-6} \cdot R$	
Voltage ratio measuring devices	$\pm 2 \text{ mV/V}$	DC voltage bridge voltage: 1.0 V	0.5 $\mu\text{V/V}$	calibration in any points between negativ und positiv value with the specified measuring range
	$\pm 5 \text{ mV/V}$		0.5 $\mu\text{V/V}$	
	$\pm 10 \text{ mV/V}$		1.0 $\mu\text{V/V}$	
	$\pm 20 \text{ mV/V}$		1.5 $\mu\text{V/V}$	
	$\pm 100 \text{ mV/V}$		15 $\mu\text{V/V}$	
	$\pm 1 000 \text{ mV/V}$		150 $\mu\text{V/V}$	
	$\pm 2 \text{ mV/V}$	DC voltage bridge voltage: > 1 V to 10 V	0.3 $\mu\text{V/V}$	
	$\pm 5 \text{ mV/V}$		0.6 $\mu\text{V/V}$	
	$\pm 10 \text{ mV/V}$		1.2 $\mu\text{V/V}$	
	$\pm 20 \text{ mV/V}$		2.4 $\mu\text{V/V}$	
	$\pm 100 \text{ mV/V}$		12 $\mu\text{V/V}$	
	$\pm 1 000 \text{ mV/V}$		120 $\mu\text{V/V}$	
	$\pm 2 \text{ mV/V}$	measuring frequency: 600 Hz to 1250 Hz square bridge voltage: 1 V	0.5 $\mu\text{V/V}$	
	$\pm 5 \text{ mV/V}$		0.5 $\mu\text{V/V}$	
	$\pm 10 \text{ mV/V}$		1 $\mu\text{V/V}$	
	$\pm 20 \text{ mV/V}$		1.5 $\mu\text{V/V}$	
	$\pm 100 \text{ mV/V}$		15 $\mu\text{V/V}$	
	$\pm 2 \text{ mV/V}$	measuring frequency: 600 Hz to 1250 Hz square bridge voltage: > 1 V to 5 V	0.3 $\mu\text{V/V}$	
	$\pm 5 \text{ mV/V}$		0.6 $\mu\text{V/V}$	
	$\pm 10 \text{ mV/V}$		1.2 $\mu\text{V/V}$	
	$\pm 20 \text{ mV/V}$		2.4 $\mu\text{V/V}$	
	$\pm 2 \text{ mV/V}$	measuring frequency: 4.8 kHz bridge voltage: 1 V	0.5 $\mu\text{V/V}$	
	$\pm 10 \text{ mV/V}$		2 $\mu\text{V/V}$	
	$\pm 100 \text{ mV/V}$		15 $\mu\text{V/V}$	
$\pm 1 000 \text{ mV/V}$	120 $\mu\text{V/V}$			
$\pm 2 \text{ mV/V}$	measuring frequency: 4.8 kHz bridge voltage: 2.5 V	0.4 $\mu\text{V/V}$		
$\pm 5 \text{ mV/V}$		2 $\mu\text{V/V}$		
$\pm 10 \text{ mV/V}$		2 $\mu\text{V/V}$		
$\pm 100 \text{ mV/V}$		15 $\mu\text{V/V}$		
$\pm 2 \text{ mV/V}$	measuring frequency: 4.8 kHz bridge voltage: 5 V	0.4 $\mu\text{V/V}$		

Date of issue: 17.06.2022

Valid from: 17.06.2022

Annex to the accreditation certificate D-K-12029-01-00

On-site calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks	
Voltage ratio measuring devices	± 2 mV/V	measuring frequency: 600 Hz bridge voltage: 2.5 V	0.1 µV/V	calibration in any points between negativ und positiv value with the specified measuring range	
	± 5 mV/V		0.2 µV/V		
	± 10 mV/V		1 µV/V		
	± 2 mV/V	measuring frequency: 600 Hz bridge voltage: 5 V	0.1 µV/V		
	± 5 mV/V		0.2 µV/V		
	Voltage ratio quarter and half bridge, measuring devices	± 2.5 mV/V	measuring frequency: 225 Hz bridge voltage: 2.5 V	0.06 µV/V	Kalibrieren von Anzeigegeräten über ein induktives Brücken- bezugsnormal calibration in any points between negativ und positiv value with the specified measuring range
		± 5 mV/V		0.08 µV/V	
		± 2.5 mV/V	measuring frequency: 225 Hz bridge voltage: 5 V	0.04 µV/V	
± 5 mV/V		0.06 µV/V			
Voltage ratio quarter and half bridge, measuring devices	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square bridge voltage: 1.0 V	1 µV/V	calibration in any points between negativ und positiv value with the specified measuring range	
	± 5 mV/V		2 µV/V		
	± 10 mV/V		2 µV/V		
	± 20 mV/V		5 µV/V		
	± 100 mV/V		20 µV/V		
	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square bridge voltage: > 1 V to 2.5 V	1 µV/V		
	± 5 mV/V		2 µV/V		
	± 10 mV/V		2 µV/V		
	± 20 mV/V		5 µV/V		
	± 100 mV/V		20 µV/V		
	± 2 mV/V	DC voltage and measuring frequency: 600 Hz to 1250 Hz square bridge voltage: > 2.5 V to 5.0 V	1 µV/V		
	± 5 mV/V		2 µV/V		
	± 10 mV/V		2 µV/V		
			2 µV/V		

Abbreviations used:

- CMC Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
 DKD-R Calibration guide of Deutscher Kalibrierdienstes (DKD), published by Physikalisch-
 Technische Bundesanstalt
 EURAMET European Association of National Metrology Institutes