

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-15101-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.01.2024

Valid to: 27.06.2028

Date of issue: 17.01.2024

Holder of accreditation certificate:

Kenya Bureau of Standards

Metrology Laboratories

P.O. Box 54974, Popo Road, off Mombasa Road, 00200 Nairobi, Kenya

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-15101-01-01

D-K-15101-01-02

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 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>.

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-K-15101-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.01.2024 **Valid to:** 27.06.2028
Date of issue: 17.01.2024

This annex is a part of the accreditation certificate D-K-15101-01-00.

Holder of partial accreditation certificate:

**Kenya Bureau of Standards
Metrology Laboratories
P.O. Box 54974, Popo Road, off Mombasa Road, 00200 Nairobi, Kenya**

with the location

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Annex to the Partial Accreditation Certificate D-K-15101-01-01

Calibrations in the fields:

Electrical quantities

DC and low frequency quantities

- DC voltage
- AC voltage
- DC current
- DC resistance

Time and Frequency

- Frequency
- Time interval

High frequency and radiation quantities

Ionising radiation and radioactivity

- Dosimetry

Annex to the Partial Accreditation Certificate D-K-15101-01-01
Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
DC voltage	1.018 V		$1.0 \cdot 10^{-6} \cdot U$	U: measured value
Voltage standards	10 V		$0.4 \cdot 10^{-6} \cdot U$	
Calibrators and voltage measuring instruments	0.002 V to 0.2 V		$7.0 \cdot 10^{-6} \cdot U + 1 \mu\text{V}$	
	> 0.2 V to 2 V		$3.6 \cdot 10^{-6} \cdot U + 1 \mu\text{V}$	
	> 2 V to 20 V		$3.6 \cdot 10^{-6} \cdot U$	
	> 20 V to 200 V		$5.6 \cdot 10^{-6} \cdot U$	
	> 200 V to 1000 V		$5.6 \cdot 10^{-6} \cdot U$	
DC current	0.1 mA		$37 \cdot 10^{-6} \cdot I$	I: measured value
Current sources and measuring instruments	1 mA		$32 \cdot 10^{-6} \cdot I$	
	10 mA		$30 \cdot 10^{-6} \cdot I$	
	100 mA		$18 \cdot 10^{-6} \cdot I$	
	1 A		$34 \cdot 10^{-6} \cdot I$	
DC resistance	1 Ω		$22 \cdot 10^{-6} \cdot R$	R: measured value
Current measuring shunts	10 Ω		$25 \cdot 10^{-6} \cdot R$	
	100 Ω		$25 \cdot 10^{-6} \cdot R$	
	1 k Ω		$35 \cdot 10^{-6} \cdot R$	
	10 k Ω		$35 \cdot 10^{-6} \cdot R$	
Standard resistors	1 Ω		$0.8 \cdot 10^{-6} \cdot R$	
	10 Ω		$0.8 \cdot 10^{-6} \cdot R$	
	100 Ω		$2.8 \cdot 10^{-6} \cdot R$	
	1 k Ω		$4.4 \cdot 10^{-6} \cdot R$	
	10 k Ω		$4.6 \cdot 10^{-6} \cdot R$	
AC voltage	0.1 V	40 Hz, 1 kHz, 10 kHz, 100 kHz	$22 \cdot 10^{-6} \cdot U$	U: measured value
Calibrators and voltage measuring instruments	1 V	40 Hz, 1 kHz, 10 kHz	$9.2 \cdot 10^{-6} \cdot U$	
		100 kHz	$13 \cdot 10^{-6} \cdot U$	
	10 V	40 Hz, 1 kHz, 10 kHz	$8.0 \cdot 10^{-6} \cdot U$	
		100 kHz	$12 \cdot 10^{-6} \cdot U$	
	100 V	40 Hz, 1 kHz, 10 kHz	$14 \cdot 10^{-6} \cdot U$	
		100 kHz	$18 \cdot 10^{-6} \cdot U$	
	1000 V	40 Hz	$25 \cdot 10^{-6} \cdot U$	
		1 kHz	$22 \cdot 10^{-6} \cdot U$	
Frequency	1 MHz to 10 MHz		$1.8 \cdot 10^{-10} \text{ Hz/Hz}$	The ranges are discrete from 1 MHz, 5 MHz and 10 MHz
Standard frequency sources				
General frequency sources	0.05 Hz to 3 GHz		$1.8 \cdot 10^{-10} \text{ Hz/Hz}$	
	> 3 GHz to 26.5 GHz		$1 \cdot 10^{-9} \text{ Hz/Hz}$	
Frequency meter	0.1 Hz to 1 GHz		$5.8 \cdot 10^{-8} \text{ Hz/Hz}$	

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Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Time interval Time interval meters	1 s to 3600 s		0.02 s	Countdown timers included; Resolution of UUC factored in the UOM evaluation
Period meters	1 ms to 10 s		$5.8 \cdot 10^{-8}$ s/s	
Period generators	1 ms to 10 s		$1.8 \cdot 10^{-10}$ s/s	
Dosimetry Air Kerma rate (Gamma radiation, Cs-137)	1.76 μ Gy/hr to 35.4 mGy/hr	ISO 4037-2:2019 662 keV Gamma CS-137 0.647 TBq at 24.05.2006	5 %	

Abbreviations used:

ISO International Organization for Standardization

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-K-15101-01-02 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.01.2024

Valid to: 27.06.2028

Date of issue: 16.02.2024

This annex is a part of the accreditation certificate D-K-15101-01-00.

Holder of partial accreditation certificate:

Kenya Bureau of Standards

Metrology Laboratories

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Annex to the Partial Accreditation Certificate D-K-15101-01-02

Calibrations in the fields:

Fluid quantities

- Volume of flowing liquids
- Liquid flow rate

Mechanical quantities

- Force
- Pressure
- Acceleration
- Mass
- Weighing instruments ^{a)}

Chemical and Medical Quantities

Chemical analysis, reference materials

- Volume of liquids ^{b)}

Thermodynamic quantities

Temperature quantities

- Resistance thermometers
- Thermocouples
- Liquid-in-glass thermometers
- Mechanical thermometers
- Direct reading thermometers

^{a)} On-site calibration only

^{b)} permanent laboratory and on-site calibration

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Volume of flowing liquids Volume V of streaming water	5 L to 10 000 L	5 L to 200 L static start and stop temperature of $\theta = 10\text{ °C}$ to 30 °C	$6.0 \cdot 10^{-3} \cdot V$	V: measured value
Liquid flow rate Volume flow dV/dt of streaming water	5 L/h to 600 000 L/h	200 L to 10000 L volumetric reference standard, standing-start-and-finish calibration mode temperature of $\theta = 10\text{ °C}$ to 30 °C	$6.0 \cdot 10^{-3} \cdot V$	V: measured value
Force Force transducers (tension and compression forces)	2 kN to 10 kN	ISO 376:2011	$2 \cdot 10^{-3}$	1 MN force lever multiplication machine
	2 kN to 20 kN		$1 \cdot 10^{-3}$	
	5 kN to 50 kN		$1 \cdot 10^{-3}$	
	10 kN to 100 kN		$5 \cdot 10^{-4}$	
	20 kN to 200 kN		$5 \cdot 10^{-4}$	
	50 kN to 500 kN		$5 \cdot 10^{-4}$	
	100 kN to 1 MN		$5 \cdot 10^{-4}$	
Pressure Absolute pressure p_{abs}	0.75 bar to 1.15 bar	DKD-R 6-1:2014 EURAMET Calibration Guide No. 17 Version 3.0 Principle of measurement $p_{\text{abs}} = p_e + p_{\text{amb}}$	0.08 mbar	Pressure medium: Gas
	> 1.15 bar to 1.25 bar		$25\text{ }\mu\text{bar} + 6.0 \cdot 10^{-5} \cdot p_{\text{abs}}$	The uncertainty of the measured Atmospheric pressure has to be taken into account
	> 1.25 bar to 8.0 bar		$25\text{ }\mu\text{bar} + 4.5 \cdot 10^{-5} \cdot p_{\text{abs}}$	
Absolute pressure p_{abs}	1 bar 2 bar to 6 bar	DKD-R 6-1:2014 EURAMET Calibration Guide No. 17 Version 3.0 Principle of measurement $p_{\text{abs}} = p_e + p_{\text{amb}}$	$70\text{ }\mu\text{bar} + 6.5 \cdot 10^{-5} \cdot p_{\text{abs}}$	Pressure medium: Oil
	> 6 bar to 251 bar		$75\text{ }\mu\text{bar} + 4.0 \cdot 10^{-5} \cdot p_{\text{abs}}$	The uncertainty of the measured Atmospheric pressure has to be taken into account
	> 251 bar to 501 bar		$0.25\text{ mbar} + 4.0 \cdot 10^{-5} \cdot p_{\text{abs}}$	
	> 501 bar to 1001 bar		$0.30\text{ mbar} + 5.5 \cdot 10^{-5} \cdot p_{\text{abs}}$	
Gauge pressure p_e	0.015 bar to 0.1 bar	DKD-R 6-1:2014 EURAMET Calibration Guide No. 17 Version 3.0 EURAMET cg-3 Version 1.0	$25\text{ }\mu\text{bar} + 6.0 \cdot 10^{-5} \cdot p_e$	Pressure medium: Gas
	> 0.1 bar to 7.0 bar		$25\text{ mbar} + 4.5 \cdot 10^{-5} \cdot p_e$	

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Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Gauge pressure p_e	0 bar to 5 bar	DKD-R 6-1:2014 EURAMET Calibration Guide No. 17 Version 3.0 EURAMET cg-3 Version 1.0	$70 \mu\text{bar} + 6.5 \cdot 10^{-5} \cdot p_e$	Pressure medium: Oil
	> 5 bar to 250 bar		$75 \mu\text{bar} + 4.0 \cdot 10^{-5} \cdot p_e$	
	> 250 bar to 500 bar		$0.25 \text{ mbar} + 4.0 \cdot 10^{-5} \cdot p_e$	
	> 500 bar to 1000 bar		$0.30 \text{ mbar} + 5.5 \cdot 10^{-5} \cdot p_e$	
Mass standards	1 mg to 5 mg	OIML R 111-1: 2004	0.006 mg	For weight pieces according to OIML recommendation R 111-1:2004, Class F ₁ Measurement in air
Conventional mass	10 mg		0.008 mg	
	20 mg		0.010 mg	
	50 mg		0.012 mg	
	100 mg		0.016 mg	
	200 mg		0.020 mg	
	500 mg		0.025 mg	
	1 g		0.03 mg	
	2 g		0.04 mg	
	5 g		0.05 mg	
	10 g		0.06 mg	
	20 g		0.08 mg	
	50 g		0.10 mg	
	100 g		0.16 mg	
	200 g		0.3 mg	
	500 g		0.8 mg	
	1 kg		1.6 mg	
	2 kg		3.0 mg	
	5 kg		8.0 mg	
	10 kg		16 mg	
	20 kg		30 mg	

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Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Conventional mass	up to 5 mg	OIML R 111-1: 2004	0.018 mg	Weight pieces with free nominal values
	> 5 mg to 10 mg		0.0024 mg	
	> 10 mg to 20 mg		0.0030 mg	
	> 20 mg to 50 mg		0.0036 mg	
	> 50 mg to 100 mg		0.0045 mg	
	> 100 mg to 200 mg		0.0060 mg	
	> 200 mg to 500 mg		0.0075 mg	
	> 500 mg to 1 g		0.009 mg	
	> 1 g to 2 g		0.012 mg	
	> 2 g to 5 g		0.015 mg	
	> 5 g to 10 g		0.018 mg	
	> 10 g to 20 g		0.024 mg	
	> 20 g to 50 g		0.030 mg	
	> 50 g to 100 g		0.045 mg	
	> 100 g to 200 g		0.090 mg	
	> 200 g to 500 g		0.23 mg	
	> 500 g to 1 kg		0.45 mg	
	> 1 kg to 2 kg		0.90 mg	
	> 2 kg to 5 kg		2.25 mg	
	> 5 kg to 10 kg		4.5 mg	
	> 10 kg to 20 kg		12 mg	

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Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Conventional mass	1 to 20 mg	OIML R111-1: 2004	0.003 mg	For weight pieces according to OIML recommendation R 111-1:2004, Class E ₂ Measurement in air
	50 mg		0.004 mg	
	100mg		0.005 mg	
	200 mg		0.006 mg	
	500 mg		0.008 mg	
	1 g		0.010 mg	
	2 g		0.012 mg	
	5 g		0.016 mg	
	10 g		0.020 mg	
	20 g		0.025 mg	
	50 g		0.03 mg	
	100 g		0.05 mg	
	200 g		0.10 mg	
	500 g		0.25 mg	
	1 kg		0.5 mg	
	2 kg		1.0 mg	
	5 kg		2.5 mg	
	10 kg		5.0 mg	
	20 kg		30 mg	
Solid density	1 g	Hydrostatic method	38.8 kg/m ³	Determination of the density of weight pieces/solids according to OIML recommendation R 111-1:2004, Class E ₂
	2 g		25.8 kg/m ³	
	5 g		11.6 kg/m ³	
	10 g		7.7 kg/m ³	
	20 g		4.8 kg/m ³	
	50 g		2.5 kg/m ³	
	100 g		1.9 kg/m ³	
	200 g		1.9 kg/m ³	
	500 g		1.9 kg/m ³	
	1000 g		1.9 kg/m ³	
Solid volume	0.125 cm ³	Hydrostatic method	0.0006 cm ³	Determination of the volume of weight pieces/solids according to OIML recommendation R 111-1:2004, Class E ₂
	0.25 cm ³		0.0008 cm ³	
	0.625 cm ³		0.0009 cm ³	
	1.25 cm ³		0.0012 cm ³	
	2.5 cm ³		0.0015 cm ³	
	6.25 cm ³		0.002 cm ³	
	12.5 cm ³		0.003 cm ³	
	25 cm ³		0.006 cm ³	
	62.5 cm ³		0.015 cm ³	
	125 cm ³		0.03 cm ³	
Acceleration	10 Hz to 1 kHz	ISO 16063-21:2003	1.0 %	

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Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Charge sensitivity (modulus) of an accelerometer	> 1 kHz to 5 kHz		1.5 %	
	> 5 kHz to 7.5 kHz		2.0 %	
	> 7.5 kHz to 10 kHz		2.2 %	
Voltage sensitivity (modulus) of an acceleration measuring chain	> 1 kHz to 5 kHz		1.5 %	
	> 5 kHz to 7.5 kHz		2.0 %	
	> 7.5 kHz to 10 kHz		2.2 %	
Temperature quantities Resistance thermometers	-40 °C to 30 °C	Alcohol bath DKD-R-5-1:2018	0.15 K	Comparison measurement with a standard resistance thermometer
	> 30 °C to 80 °C	Water bath DKD-R-5-1:2018	0.15 K	
	> 80 °C to 200 °C	Oil Bath DKD-R-5-1:2018	0.15 K	
	> 200 °C to 420 °C	Furnace DKD-R-5-1:2018	0.15 K	
Liquid in glass thermometers	-40 °C to 30 °C	Alcohol bath	0.3 K	Comparison measurement with a standard resistance thermometer
	> 30 °C to 80 °C	Water bath	0.3 K	
	> 80 °C to 200 °C	Oil Bath	0.3 K	
	> 200 °C to 300 °C	Fluidized bath	0.3 K	
Mechanical (Dial Gauge) thermometers	-40 °C to 30 °C	Alcohol bath	0.2 K	Comparison measurement with a standard resistance thermometer
	> 30 °C to 80 °C	Water bath	0.2 K	
	> 80 °C to 200 °C	Oil Bath	0.2 K	
	> 200 °C to 300 °C	Fluidized bath	0.2 K	
Direct reading electrical thermometers	-40 °C to 30 °C	Alcohol bath DKD-R-5-1:2018 DKD-R-5-3:2018	0.15 K	Comparison measurement with a standard resistance thermometer
	> 30 °C to 80 °C	Water bath DKD-R-5-1:2018 DKD-R-5-3:2018	0.15 K	
	> 80 °C to 200 °C	Oil Bath DKD-R-5-1:2018 DKD-R-5-3:2018	0.15 K	
	> 200 °C to 660 °C	Furnace DKD-R-5-1:2018 DKD-R-5-3:2018	0.15 K	

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Noble metal thermocouples Type S / R	0 °C to 200 °C	Liquid bath DKD-R-5-3:2018	1.5 K	Comparison measurement with a standard resistance thermometer
	> 200 °C to 420 °C	Furnace DKD-R-5-3:2018	1.5 K	
	> 420 °C to 1200 °C	Furnace DKD-R-5-3:2018	2.5 K	Comparison measurement with a standard thermocouple
Base metal thermocouples Type J / K / N	0 °C to 1200 °C	Furnace DKD-R-5-3:2018	5 K	Comparison measurement with a standard thermocouples
Volume of liquids Piston operated pipettes	100 µL to < 200 µL	ISO 8655-2:2002 (withdrawn)	0.3 µL	
	200 µL to < 1000 µL		3 µL	
	1000 µL to 10000 µL		20 µL	

Annex to the Partial Accreditation Certificate D-K-15101-01-02

On-site Calibration

Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Weighing instruments Non-automatic electronic weighing instruments	up to 20 g	EURAMET Calibration Guide No. 18:2015	$3.1 \cdot 10^{-6}$	with weights according to OIML R 111-1:2004, Class E ₂
	up to 500 g		$5.2 \cdot 10^{-7}$	with weights according to OIML R 111-1:2004, Class E ₂
	up to 60 kg		$1.6 \cdot 10^{-6}$	with weights according to OIML R 111-1:2004, Class F ₁
	up to 300 kg		$1.5 \cdot 10^{-5}$	with weights according to OIML R 111-1:2004, Class M ₁
Volume of liquids Piston operated pipettes	100 µL to < 200 µL	ISO 8655-2:2002 (withdrawn)	0.3 µL	
	200 µL to < 1000 µL		3 µL	
	1000 µL to 10000 µL		20 µL	

Abbreviations used:

DKD-R	Calibration Guideline of Deutscher Kalibrierdienst (DKD), published by Physikalische Technische Bundesanstalt
EURAMET	European Association of National Metrology Institutes
OIML	International Organization of Legal Metrology
ISO	International Organization for Standardization