

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-12094-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 19.04.2022

Date of issue: 19.04.2022

Holder of certificate:

**Horiba Europe GmbH – Zweigniederlassung Darmstadt
Landwehrstraße 55, 64293 Darmstadt**

Calibration in the fields:

Mechanical quantities

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

Thermodynamic quantities

Temperature quantities

- Radiation thermometers ^{a)}
- Temperature indicators and simulators ^{a)}

Electrical quantities

DC and low frequency quantities

- DC voltage ^{a)}
- DC current ^{a)}

^{a)} only on-site calibration

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

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.
<https://www.dakks.de/en/content/accredited-bodies-dakks>*

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On-site Calibration
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Torque Torque measurement devices in test benches	100 N·m to 1000 N·m	KPA-704:V02 of 21.09.2021	0.46 N·m	calibration with TORQCAL1000
	500 N·m to 5000 N·m		2.0 N·m	calibration with TORQCAL5000
Power breaks	500 N·m to 5000 N·m		2.5 N·m	
Force Tensile force on chassis dynamometers	100 N to 5400 N	KA-706:V01 of 01.02.2021	0.49 N	light duty test benches
	100 N to 7500 N		0.58 N	mid duty test benches
	100 N to 12500 N		1.86 N	heavy duty test benches
Pressure Positive and negative overpressure p_e	-1 bar to 20 bar	DKD-R 6-1:2014	$5 \cdot 10^{-4} p_e$ but not < 0.3 mbar	pressure medium: gas
	0 bar to 350 bar		$8 \cdot 10^{-4} p_e$ but not < 0.05 bar	fluid medium: oil
Absolute pressure p_{abs}	0.25 bar to 2 bar	DKD-R 6-1:2014	$8 \cdot 10^{-4} p_{abs}$ but not < 0.4 mbar	fluid medium: gas
Temperature quantities Pyrometer	-18 °C to -15 °C	VDI/VDE 3511 part 4.4:2005	2.2 K	
	> -15 °C to 0 °C		2.0 K	
	> 0 °C to 40 °C		2.0 K	
	> 40 °C to 70 °C		2.2 K	
	> 70 °C to 100 °C		2.4 K	
	100 °C	VDI/VDE 3511 part 4.4:2005	1.8 K	
	> 100 °C to 350 °C		2.5 K	
	> 350 °C to 550 °C		2.9 K	
	> 550 °C to 750 °C		3.4 K	
	> 750 °C to 980 °C		3.7 K	
Temperature-simulation Pt100	-200 °C to 760 °C	KA-708:V01 of 01.07.2020	0.52 K	for simulation of Pt100-temperature through resistance according to ITS 90
Thermocouple type J	0 °C to 1200 °C	KA-709:V01 of 01.07.2020	0.53 K	for simulation of thermocouple-temperature through voltage according to ITS 90
Thermocouple type K	-140 °C to 1200 °C		0.70 K	
Thermocouple type T	-230 °C to 400 °C		1.1 K	
Electrical quantities DC voltage	0 V to 10 V	KA-711:V01 of 01.07.2020	2.4 mV	
DC current	0 mA to 20 mA	KA-712:V01 of 01.07.2020	6.0 µA	

¹⁾ The expanded uncertainties according to EA-4/02 M:2021 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

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Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V.
DKD-R	Calibration guide of Deutscher Kalibrierdienst (DKD), published by Physikalisch-Technische Bundesanstalt
EURAMET	European Association of National Metrology Institutes
KA-	Internal calibration guideline of Horiba Europe GmbH
KPA-	Internal calibration procedure of Horiba Europe GmbH
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik
VDI	Verein Deutscher Ingenieure

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