Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-19153-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **07.06.2022**

Date of issue: 20.02.2023

Holder of accreditation certificate:

Kalibrierlabor HIGHVOLT Prüftechnik Dresden GmbH
Marie-Curie-Straße 10, 01139 Dresden

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.

Calibration in the fields:

Electrical quantities

DC and low frequency quantities

- **DC voltage**[*)]
- **AC voltage** [*)]
- **AC current** [*)]
- **Capacitance** [*)]
- **High voltage quantities** [*)]
- **High voltage impulse quantities** [*)]
- **Electrical power** [*)]

[*)] **also on-site calibration**

Within the scope of accreditation marked with [a)], 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.

Permanent laboratory and on-site calibration

Calibration and Measurement Capabilities (CMC)

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability	Remarks
DC voltage measuring intruments	1 V to 1000 V		0.05 %	
AC voltage measuring intruments	1 V to 700 V	50 Hz	0.08 %	*U*eff, $\hat{U}/\sqrt{2}$
	100 V to	10 Hz to 500 Hz	0.08 %	
	30 V to	40 Hz to 1 kHz	0.08 %	
DC voltage [a] measuring systems, dividers	1 kV to 600 kV	IEC 60060:2010	0.4 %	
	> 600 kV to 3000 kV	IEC 60060:2010 linearity test	1.0 %	
AC voltage [a] measuring systems, dividers	1 kV to 5 kV	17 Hz bis 300 Hz	0.45 %	*U*eff, $\hat{U}/\sqrt{2}$
	> 5 kV to 400 kV		0.35 %	
	> 400 kV to 800 kV [1]		0.6 %	
	800 kV to 4000 kV [2]	IEC 60060:2010 50 Hz linearity test	1.0 %	
Lightning impulse voltage peak value LI measuring intruments, calibrators	9 V to 330 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	0.3 %	
	35 V to 1000 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	0.6 %	
Lightning impulse voltage LI front time T_1 measuring intruments, calibrators	0.84 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.3 %	
	0.84 µs	35 V to 1000 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	1.6 %	
	1.56 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.3 %	
Lightning impulse voltage LI, time to half value T_2 measuring intruments, calibrators	60 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF	1.0 %	
	60 µs	35 V to 1000 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	1.6 %	

[1] vor Ort bis 400 kV
[2] vor Ort bis 2000 kV

Permanent laboratory and on-site calibration

Calibration and Measurement Capabilities (CMC)

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability	Remarks
Switching impulse voltage peak value SI measuring intruments, calibrators	9 V to 330 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	0.3 %	
	35 V to 850 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	0.6 %	
Switching impulse voltage SI, time to peak T_P	20 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.5 %	
	250 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.5 %	
	250 µs	35 V to 850 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	1.6 %	
Switching impulse voltage SI, time to half value T_2	4000 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.0 %	
	2500 µs	9 V to 330 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.0 %	
	2500 µs	35 V to 850 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	1.6 %	
Chopped lightning impulse voltage LIC peak value	20 V to 310 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	0.7 %	
	35 V to 750 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	0.7 %	
Chopped lightning impulse voltage LIC time to chop T_C	0.5 µs to 6 µs	20 V to 310 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	1.6 %	
	0.5 µs to 6 µs	35 V to 750 V IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, connection via coaxial cable length 2 m	1.6 %	

Permanent laboratory and on-site calibration

Calibration and Measurement Capabilities (CMC)

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability	Remarks
STEP (step voltage) measuring intruments, calibrators	9 V to 330 V	IEC 61083:2013, load ≥ 1 MΩ ≤ 50 pF, direct connected	0.35 %	
Lightning impulse voltage Peak value LI [a)] measuring systems, dividers	40 kV to 250 kV	IEC 60060:2010	0.45 %	
	1 kV to 800 kV		0.65 %	
	800 kV to 4000 kV	IEC 60060:2010 lineary test	0.85 %	
Switching impulse voltage Peak value SI [a)] measuring systems, dividers	40 kV to 250 kV	IEC 60060:2010	0.4 %	
	1 kV to 700 kV		0.6 %	
	700 kV to 3500 kV	IEC 60060:2010 lineary test	0.85 %	
Time parameter impulse voltage LI front time T_1, peak time T_p, LI time to half value T_2, LIC time to chop T_C	0.5 µs to 4000 µs		2.1 %	
Capacitance	10 pF to 10 nF	0.5 kV bis 200 kV; 50 Hz	0.03 %	
		10 kV bis 800 kV; 50 Hz lineary test	0.1 %	
	100 pF	0.5 kV bis 100 kV; 50 Hz	0.03 %	
	10 pF to 10 nF		0.1 %	
Dissipation factor tan δ	$1 \cdot 10^{-5}$ to $1 \cdot 10^{-2}$	IEC 60270:2000 AMDI:2015	$2.0 \cdot 10^{-5}$ (absolute value)	
Impulse charge q	1 pC to < 2 pC		7 %	
	2 pC to 10 nC		5 %	
rise time t_r	1 ns to 1 µs		5 %	
Impulse current shunt, measuring systems with shunt [a)]	200 A to 40 kA	IEC 62475:2010 Impulse current up to 8 µs / 20 µs	0.65 %	
Impulse current Rogowski-current sensors and measuring systems Rogowski- current sensors [a)]	200 A to 200 kA	IEC 62475:2010 Impulse current up to 8 µs / 20 µs	1.0 %	

Permanent laboratory and on-site calibration

Calibration and Measurement Capabilities (CMC)

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability	Remarks
Impulse current Time parameters [a)]	6 µs to 24 µs		2.1 %	
AC voltage power measuring systems, components	40 V to 100 kV	16.7 Hz ≤ f ≤ 60 Hz	0.025 %	U_{eff}, $\hat{U}$
AC current power measuring systems, components	0.4 to 2000 A	16.7 Hz ≤ f ≤ 60 Hz	0.035 %	I_{eff}, $\hat{I}$
AC current active power, single phase power measuring systems	0 W to 200 MW	40 V ≤ U ≤ 100 kV 0.4 A ≤ I ≤ 2000 A -90° ≤ $\varphi_{U,I}$ ≤ 90° 16.7 Hz ≤ f ≤ 60 Hz	0.04 %	
AC current reactive power single phase	0 var to 200 Mvar	40 V ≤ U ≤ 100 kV 0.4 A ≤ I ≤ 2000 A -90° ≤ $\varphi_{U,I}$ ≤ 90° 16.7 Hz ≤ f ≤ 60 Hz	0.04 %	
AC current apparent power single phase	16 VA to 200 MVA	40 V ≤ U ≤ 100 kV 0.4 A ≤ I ≤ 2000 A 16.7 Hz ≤ f ≤ 60 Hz	0.04 %	

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V.
IEC	International Electrotechnical Commission