Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-17601-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **15.12.2020**

Date of issue 08.04.2021

Holder of certificate:

H+H High Voltage Technology GmbH
Im Kurzen Busch 15, 58640 Iserlohn

Calibration in the fields:

Electrical quantities
- **DC and low frequency quantities**
  - **DC voltage** *)
  - **AC voltage** *)
  - **High voltage quantities** *)
  - **High voltage impulse quantities** *)
  - **Charge**

High frequency and radiation quantities
- **High frequency quantities**
  - **Rise time**
  - **Waveform quantities**

*) **also on site calibration**

Within the scope of accreditation 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 calibra-tion procedures within the flexible scope of accreditation.

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

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement [1)]	Remarks
DC voltage	-1 kV	to	-100 kV		0.7 %	
	1 kV	to	100 kV		0.7 %	
AC voltage						
	1 kV	to	100 kV	50 Hz	0.4 %	
	50 kV	to	300 kV	50 Hz	0.8 %	
Burst voltage (*LI*)						*LI* = Lightning Impulse
Amplitude	-10 kV	to	-500 kV		0.8 %	
	10 kV	to	500 kV		0.8 %	
Time parameter						T_1 = Front slope time
T_1	0.8 µs	to	1.6 µs		2.2 %	T_2 = Back slope-
T_2	40 µs	to	60 µs		2.2 %	Half lifetime
Impulse charge [**)]	1 pC	to	100 nC	DIN EN 60270-2:2011-10	0.03 · q + 0.5 pC	q: charge quantity
Rise time t_r	3 ns	to	1,0 µs		4,1 %	
Electrostatic discharge (ESD) [**)]				DIN EN 61000-4-2:2009-12		I_P = first burst current peak
Current pulse I_P	1 A	to	35 A		3.1 %	
Basic values						
Current pulse I_{30}	1 A	to	35 A		1.9 %	I_{30} = current at 30 ns
Current pulse I_{60}	1 A	to	35 A		1.9 %	I_{60} = current at 60 ns
Rise time t_r	0.6 ns	to	1 ns		3.9 %	U_L = free state-
DC voltage U_L	1 kV	to	100 kV		0.7 %	voltage
EFT/B Burst [**)]				DIN EN 61000-4-4:2013-04		R_L = load resistor
Voltage pulse	100 V	to	2200 V		1.7 %	
	100 V	to	4400 V		2.1 %	on R_L = 50 Ω
Rise time and Impulse width	3 ns	to	1 µs		4.1 %	on R_L = 1000 Ω
Burst duration and burst periode	100 ns	to	1 s		2.0 %	
Surge [**)]				DIN EN 61000-4-5:2015-03		
DC-amplitude	500 V	to	12 kV		1.9 %	
Current amplitude	1 A	to	120 kA		3.0 %	
Rise time and Impulse width	0.8 µs	to	1.0 ms		1.0 %	
Dips				DIN EN 61000-4-11:2005-02		
Voltage amplitude [**)]	1 V	to	700 V	16 ⅔ Hz ; 50 Hz ; 60 Hz	1.3 %	
Time interval	100 ns	to	1 s		0.6 %	

[1)] The expanded uncertainties according to EA-4/02 M:2013 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.

DAkkS Deutsche Akkreditierungsstelle

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement [1)]	Remarks
DC voltage	-1 kV	to	-100 kV		0.7 %	
	1 kV	to	100 kV		0.7 %	
AC voltage						
	1 kV	to	100 kV	50 Hz	0.4 %	
	50 kV	to	300 kV	50 Hz	0.8 %	
Burst voltage (*LI*)						*LI* = Lightning Impulse
Amplitude	-10 kV	to	-500 kV		0.8 %	
	10 kV	to	500 kV		0.8 %	T_1 = Front slope time
Time parameter						T_2 = Back slope-half lifetime
T_1	0.8 µs	to	1.6 µs		2.2 %	
T_2	40 µs	to	60 µs		2.2 %	

Abbreviations used:

CMC	Calibration and measurement capabilities
DIN	Deutsches Institut für Normung e.V.

[1)] The expanded uncertainties according to EA-4/02 M:2013 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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