

Annex 06
of 2009-01-23 to the accreditation certificate of the calibration laboratory

Registration number:
DKD-K-18701
Page 1 of 3

at

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Accredited since: 1997-11-13

Measured quantities:

Force
DC voltage*)
AC voltage *)
impulse voltage *)
time parameter *)
impulse charge
linearity of indication
magnetic flux density
electric field
high current
resistance

*) also onsite calibrations

Permanent Laboratory

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability ¹⁾	Remarks
Force calibration of force transducers (compression forces)	0,2 MN to < 0,5 MN	EN 10002-3, ISO 376, DKD R 3-3	0,5 %	32 MN force calibration machine with a reference force transducer system
	0,5 MN to < 1 MN		0,2 %	
	1 MN to 16 MN		0,1 %	
	> 16 MN to 32 MN		0,2 %	
Electrical Quantities DC Voltage	350 mV to 1000 V		0,02 %	Calibration of measuring instruments
	10 kV to 200 kV		0,2 %	
	10 kV* to 350 kV*		0,4 %*	
	350 kV to 1000 kV		1,0 %	
	1 kV to 40 kV	According to IEC 60060	0,3 %	
AC Voltage	1 V to 1000 V	10 Hz to 10 kHz	0,11 %	Calibration of measuring instruments
	1 kV To 30 kV	50 Hz to 150 Hz	0,8 %	Calibration of Measuring systems according to predetermined procedures
	25 kV to 200 kV 200 kV to 1200 kV	According to IEC 60060	0,6 % 0,9 %	
Lightning Impulse (LI)	50 V to 1000 V	According to IEC 61083 Load: $\geq 1M\Omega \leq 50 pF$	0,6 %	Calibration of measuring instruments and impulse calibrators
Time parameters T ₁ T ₂	0,84 μs 60 μs	Coaxial cable: Length 1,5 m	2,0 % 2,0 %	
Chopped Lightning Impulse (LIC)	50 V to 750 V		0,8 %	

The best measurement capabilities are stated according to DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 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.

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability ¹⁾	Remarks
Time parameters T_c	0,5 μ s		2,0 %	
Switching Impulse (SI)	50 V to 1000 V		0,6 %	
Time parameters T_p T_2	20 μ s 4000 μ s		2,0 % 2,0 %	
Cont. Electrical Quantities				Measuring systems according to predetermined procedures
Lightning LV Impulse (SI)	1kV to 100 kV		0,8 %	
Time parameters T_1 T_2	0,8 μ s to 1,6 μ s 49 μ s to 60 μ s	According to IEC 60060	4,4 % 4,4 %	
Switching Impulse	1kV to 100 kV	According to IEC 60060	0,8 %	
Time parameters T_p T_2	200 μ s to 300 μ s 1 ms to 4 ms		4,4 % 4,4 %	
HV Impulse (LI)	210 kV to 215 kV 25 kV to 500 kV 500 kV to 1800 kV	According to IEC 60060	0,6 % 0,7 % 0,8 %	
Time parameters T_1 T_2	0,8 μ s to 1,6 μ s 40 μ s to 60 μ s		4,0 % 4,0 %	
HV Impulse (SI)	210 kV to 215 kV 25 kV to 500 kV	According to IEC 60060	0,6 % 0,7 %	
Time parameters T_p T_2	200 μ s to 300 μ s 1000 μ s to 4000 μ s		4,0 % 4,0 %	
Impulse charge q	2 pC to 2000 pC	According to IEC 60270	0,4 pC + 0,03 q	PD Calibrators
Indication linearity	2 pC to 2000 pC		0,3 pC + 0,03 q	PD Measuring devices
High AC current / Shunt and Rogowski Coil	100 A _{rms} to 60 kA _{rms} 250 A _{peak} to 150 kA _{peak}	50 Hz/IEC 62475	2 %	
Time parameter, rise time T_R / shunt	24 ns to 1000 ns	IEC 62475	2,5 %	Total rise time including rise time of generator and measuring system
Resistance / Shunt resistances	4 $\mu\Omega$ to 200 m Ω	temperature: (22 +/- 2) $^{\circ}$ C humidity: (35+/- 10)% rH	0,5 % 2,1 %	Uncertainty according to measuring range of the measuring instrument
Magnetic flux density B	10 μ T to 20 μ T 20 μ T to 50 μ T 50 μ T to 900 μ T	50 Hz Uniform Magnetic Field	1,6 % 1,0 % 0,6 %	
Calibration of Magnetic Flux Density Meters				
Electric Field Calibration of electric field meters	10 V/m to 60 V/m	200 MHz – 1 GHz Antenna distance EUT 1m – 2m unmodulated, linear, polarised antenna field	1 dB	

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On-site calibration

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability ¹⁾	Remarks
DC voltage	30 kV to 200 kV	According to IEC 60060	0,7 %	Calibration of measuring systems and dividers
AC voltage	30 kV to 200 kV	50 Hz to 150 Hz According to IEC 60060	0,7 %	
Impulse voltage (LI)	25 kV to 500 kV	According to IEC 60060	0,8 %	
Time parameters T_1 T_2	0,8 μ s to 1,6 μ s 40 μ s to 60 μ s		4,5 %	
Impulse voltage (SI)	25 kV to 500 kV	According to IEC 60060	0,8 %	
Time parameters T_p T_2	200 μ s to 300 μ s 1000 μ s to 4000 μ s		4,5 %	

The best measurement capabilities are stated according to DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 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.