



Accreditation number **SCS 081**  
Numero d'accREDITAMENTO

## SCS Directory Registro SCS

Accreditation Standard ISO/IEC 17025:2005  
Norma d'accREDITAMENTO ISO/IEC

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### Calibration laboratory for electrical quantities in the field of DC/AC, high voltage, capacitance and impulse charge

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Head of laboratory : Hans-Jürg Weber  
Deputy :  
Responsible for QM : Hans-Jürg Weber  
First accreditation : 04.09.1997  
Last accreditation : 03.02.2008  
Updated version : [www.sas.ch](http://www.sas.ch)

#### Measured quantities

Direct voltage  
Alternating voltage  
Impulse voltages and time parameters  
Capacitance  
Apparent charge (partial discharge)

#### Mutations

Personnel :  
Extensions : 01.10.99, 01.02.08  
Address :  
Edition : **SCS081/B**

The given extended measurement uncertainty is the standard uncertainty of the measurement multiplied by an extension factor  $k = 2$ , which correspond to a confidence level of about 95 % for a normal distribution.

Measured Quantity Instrument or Gauge	Measurement range	Measurement Conditions at 23 °C	Best measurement capability ±	Remarks
<b>Direct voltage</b> calibration of voltmeters  cal. of measuring systems	100 mV ... < 1000 V		0,01 %	according to EN/IEC 60060-2
	1000 V ... 200 kV		0,4 %	calibration also on site
<b>Alternating voltage</b> calibration of voltmeters  calibration of measuring systems	100 mV ... 33 V	10 Hz ... < 45 Hz	0,2 %	
	100 mV ... 1000 V	45 Hz ... 1 kHz	0,1 %	
	10 kV ... 200 kV	50 Hz/100 Hz/150 Hz	0,4 %	according to EN/IEC 60060-2 (calibration also on site)
	10 kV ... 200 kV	15 Hz - 300 Hz	0,5 %	
	10 kV ... 700 kV	50 Hz/100 Hz/150 Hz	0,5 %	calibration only at ETH
	10 kV ... 700 kV	15 Hz - 300 Hz	0,6 %	
<b>Capacitance at 50 Hz</b>	10 pF ... 1000 nF	100 V ... 2000 V	0,015 %	calibration only at ETH
	10 pF ... 100 nF	100 V ... 100 kV	0,02 %	calibration also on site
	10 pF ... 75 nF	10 kV ... 700 kV	0,03 %	calibration only at ETH



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Measured Quantity Instrument or Gauge	Measurement range	Measurement Conditions at 23 °C	Best measurement capability ±	Remarks	
<b>Lightning impulse (LI)</b>  front time $T_1$ time to half-value $T_2$	40 V ... 1000 V	load impedance: $\geq 1 \text{ M}\Omega / \leq 50 \text{ pF}$	0,3 %	calibration of measurement instruments according to EN/IEC 60060-2 (impulse peak voltmeter or digital recorder)	
	0,84 $\mu\text{s}$ 60 $\mu\text{s}$		2,5 % 1,5 %		
	<b>Chopped light. imp. (LIC)</b>  time to chopping $T_c$		40 V ... 1000 V		load impedance: $\geq 1 \text{ M}\Omega / \leq 50 \text{ pF}$
0,5 $\mu\text{s}$					
<b>Switching impulses (SI)</b>  Time to peak $T_p$ time to half-value $T_2$		40 V ... 1000 V	load impedance: $\geq 1 \text{ M}\Omega / \leq 50 \text{ pF}$		0,2 % 2,5 % 1,5 %
	20 $\mu\text{s}$ 4 ms				
	<b>Lightning impulse (LI)</b>  front time $T_1$ time to half-value $T_2$	200 kV ... 250 kV 10 kV ... 500 kV			0,5 % 0,7 %
0,84 $\mu\text{s}$ ... 1,56 $\mu\text{s}$ 40 $\mu\text{s}$ ... 60 $\mu\text{s}$		1,7 % 1,7 %			
<b>Chopped light. imp. (LIC)</b>  time to chopping $T_c$		200 kV ... 250 kV 10 kV ... 500 kV			0,5 % 0,9 %
	0,5 $\mu\text{s}$ ... 2 $\mu\text{s}$	2,0 %			
	<b>Switching impulses (SI)</b>  time to peak $T_p$ time to half-value $T_2$	200 kV ... 250 kV 10 kV ... 500 kV	0,5 % 0,7 %		
200 $\mu\text{s}$ ... 300 $\mu\text{s}$ 1 ms ... 4 ms		1,7 % 1,7 %			
<b>Impulse current</b>  Calibration of converting devices and complete impulse current measuring systems		10 A ... 20 kA	Lightning- and standard impulse currents	0,15 % Scale factor	according to IEC 60060-1 and EN/IEC 60060-2
	Linearity test, step response				



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Measured Quantity Instrument or Gauge	Measurement range	Measurement Conditions at 23 °C	Best measurement capability ±	Remarks
<b>Partial discharge (PD)</b> apparent charge $q_0$  rise time $t_r$ , pulse duration $\Delta t$ and resolution time $T_r$	1 pC ... 2000 pC  2 ns ... 10 ms		0,03·q + 0,4 pC (q in pC)  3 %	calibration of PD calibrators an PD instruments according to IEC 60270