Schweizerische Eidgenossenschaft
Confédération suisse
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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER

State Secretariat for Economic Affairs SECO
Swiss Accreditation Service SAS

SCS Directory

Accreditation number: SCS 0114

International standard: ISO/IEC 17025:2017

Swiss standard: SN EN ISO/IEC 17025:2018

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Initial accreditation: 22.06.2009

Current accreditation: 22.06.2019 to 21.06.2024

Scope of accreditation see: www.sas.admin.ch (Accredited bodies)

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Scope of accreditation as of 06.04.2023

Calibration laboratory for electrical quantities

Calibration and Measurement Capability (CMC)

Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement uncertainty ± [1)]	Remarks
DC Voltage [2)]	1 mV ... 1000 V		0,20 %	Output Voltage of Arbitrary Generators and Voltage Sources ISO 7637-2
DC High Voltage [2)]	100 V ... 30 kV		3,18 %	Output Voltage of Test Generators and Charging Voltages of Pulse Circuits IEC 61000-4-x ISO 7637-2

[1)]The given extended measurement uncertainty is the standard uncertainty of the measurement multiplied by an extension factor k = 2, which corresponds to a confidence level of about 95% for a normal distribution.
[2)] On-site calibrations with increased measurement uncertainty possible.

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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement uncertainty ± [1]	Remarks
AC Voltage [2]	1 mV ... 1000 V		0,23 %	Arbitrary Generators, Power Fail Generators, Variacs IEC 61000-4-x ISO 7637-2
DC Current [2]	1 mA ... 100 A		0,20 %	
AC Current [2]	1 mA ... 100 A		0,20 %	
Frequency, Sine [2]	DC ... 1 MHz 10 kHz ... 4 GHz		$4 \cdot 10^{-3}$ $17{,}9 \cdot 10^{-6}$	Only DC … 1 MHz on-site possible
DC Resistance [2]	1 mΩ ...10 MΩ		0,24 %	
Inductance [2]	1 µH ... 1000 H	f=1 kHz	0,21 %	
Capacitance [2]	100 pF ... 100 µF	f=1 kHz	0,44 %	
ESD				IEC 61000-4-2 ISO 10605
Voltage	100 V ... 30 kV	DC	0,17 %	
Current Peak	0 A ... 120 A		4,70 %	
Current	Current	@30 ns @60 ns @60-800 ns	4,70 % + (12 %)* 4,70 % + (8 %)* 4,70 % + (8 %)* (%)* Reproducibility device setup	
Rise Time	500 ps ... 1 µs		30,47 ps	
Burst into 50 Ω [2]				IEC 61000-4-4 ISO 7637-2
Voltage	20 V ... 6000 V		4,95 %	
	200 V ... 8000 V		5,01 %	
	20 V ... 8000 V	Common Mode	7,63 %	
Rise Time	1 ns ... 1 µs		184 ps	
Pulse Duration	10 ns ... 10 µs		1602 ps	
Repetition Frequency	1 Hz ... 1 MHz		$4 \cdot 10^{-3}$	
Burst into 1000 Ω [2]				IEC 61000-4-4 ISO 7637-2
Voltage	20 V ... 6000 V		5,04 %	
	200 V ... 8000 V		5,35 %	
	25 V ... 1000 V	Common Mode	7,70 %	
Rise Time	1 ns ... 1 µs		258 ps	

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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement uncertainty ± [1]	Remarks
Pulse Duration	10 ns ... 10 µs		2,4 ns	
Repetition Frequency	1 Hz ... 1 MHz		$4 \cdot 10^{-3}$	
Pulses µs range [2]				ISO 7637-2 IEC 61000-4-5
Voltage	100 V ... 12000 V		4,87 %	
	1000 V ... 20000V		4,96 %	
Rise Time	100 ns ... 100 µs	Voltage	2,1 ns	
		Current	51 ns	
Pulse Duration	1 µs ... 1000 µs	Voltage	540 ns	
		Current	128 ns	
Current	1 A ... 1000 A		3,67 %	
	100 A ...20'000 A		3,88 %	
Pulses ms range [2]				ISO 7637-2
Voltage	10 V ... 1000 V		4,65 %	
Rise Time	50 µs ... 50 ms		3,1 ns	
Pulse Duration	1000 µs ... 1500 ms		2,6 µs	
Current	1 A ... 5000 A		6,46 %	
Ringwave [2]				ANSI C62.41 IEC 61000-4-12
Voltage	200 V ... 6000 V		3,94 %	
Current	5,3 A ... 500 A		1,81 %	
Rise Time	0,1 µs ... 5µs	Voltage	2,26 ns	
		Current	2.01 ns	
Frequency	DC ... 250 kHz		$4 \cdot 10^{-3}$	
Damped Oscillatory [2]				IEC 61000-4-12
Voltage	200 V ... 4000V		1.13 %	
Current	1 A ... 120A		1,81 %	
Rise Time	0,05 µs ... 5 µs	Voltage	10.22 ns	
		Current	51 ns	Not requested by -12
Frequency	DC ... 1 MHz		$4 \cdot 10^{-3}$	

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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement uncertainty ± [1]	Remarks
Fast Damped Oscillatory [2]				IEC 61000-4-18
Voltage	200 V ... 6000V		3.57 %	
Current	1 A ... 120A		3,79 %	
Rise Time	0,5 ns ... 1 µs	Voltage	242,77 ps	
	0,5 ns ... 10 µs	Current	231,17 ps	
Frequency	DC ... 100 MHz		$4 \cdot 10^{-3}$ %	
Power Fail [2]				IEC 61000-4-11
Voltage (cont.)	-400 V ... 400 V	With or without load	0,05 %	
Peak Voltage (Over- and Undershoot)	-20 V ... 270 V	100 Ω load	3,35 %	
Rise Time/Fall Time	0,1 µs ... 10 µs	100 Ω load	1,78 ns	
Current	10 A ... 50 A	100 Ω load	2,27 %	
Peak Current (Inrush)	200 A ... 1000 A		1,94 %	
Phase	0 ° ... 360 °		1,27 °	
ESD target				IEC 61000-4-2 ISO 10605
Input Impedance	0,1 Ω ... 50 Ω	DC	1,36 %	
Transfer Impedance	0,1 Ω ... 50 Ω	DC	1,38 %	
Insertion Loss	20 dB ... 60 dB	20 kHz ... 4 GHz	0,66 dB	
ESD target adapter				IEC 61000-4-2 ISO 10605
Return Loss (low reflect)	-60dB ... -20dB	20 kHz ... 1 GHz	0,03	
	-40dB ... -5dB	>1 GHz ... 4 GHz	0,04	
Insertion Loss	0 dB ... 10dB	20 kHz ... 4 GHz	0,07 dB	
Burst adapter (High Imp)				IEC 61000-4-4
Input Impedance	100 Ω ... 100 kΩ	DC	0,16 %	
Insertion loss	45 dB ... 65dB	20 kHz ... 400 MHz	0,61 dB	
Burst adapter (Match)				IEC 61000-4-4
Input Impedance	40 Ω ... 60 Ω	DC	0,16 %	
Insertion loss	35 dB ... 55 dB	20 kHz ... 400 MHz	0,39 dB	

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RF-voltage (50 Ω)	200 µV ... 10 V	9 kHz ... 3 GHz	1,4 %	IEC 61000-4-6
	0,01 V ... 100 V	100 kHz ... 2 GHz	1,5 %	
Amplitude Modulation				IEC 61000-4-6
Frequency	100 Hz ... 10 MHz	Carrier f = 100 kHz ... 300 MHz	$18 \cdot 10^{-6}$	
Modulation Index	10 % ... 95 %	Carrier f = 100 kHz ... 300 MHz	1,1 %	
Spurious emissions	0 dBc ... 50 dBc	Carrier f = 100 kHz ... 300 MHz	0,69 dB	IEC 61000-4-6
150-50Ω-Adapter				IEC 61000-4-6
Insertion Loss	5 dB ... 12 dB	20 kHz ... 300 MHz	0,29 dB	
	5 dB ... 12 dB	>300 MHz...1 GHz	0,47 dB	
Matching attenuator				Coaxial Connector
Attenuation	0 dB ... 40 dB	20 kHz ... 300 MHz	0,12 dB	
	0 dB ... 40 dB	>300 MHz...1 GHz	0,21 dB	
CDN				IEC 61000-4-6
Output Impedance	90 Ω ... 210 Ω	20 kHz ... 300 MHz	8,4 Ω	
50 Ohm load				IEC 61000-4-6
Impedance	40 Ω ... 60 Ω	20 kHz ... 300 MHz	1,6 Ω	
		>300 MHz ... 1 GHz	2,9 Ω	
S11	≤ 0.2	20 kHz ... 1 GHz	0,02	
AC – DC – Harmonics Source [2)]				EN/IEC 61000-4-11, EN/IEC 61000-4-13, EN/IEC 61000-4-14, EN/IEC 61000-4-17, EN/IEC 61000-4-28, EN/IEC 61000-4-29, EN/IEC 61000-3-2, EN/IEC 61000-3-3, EN/IEC 61000-3-11, EN/IEC 61000-3-12
AC Voltage RMS	1 mV … 750 V	15 Hz … 850 Hz	0,2 %	
AC Voltage RMS	1 mV … 100 V	1 Hz … 10 kHz	0,2 %	
AC Voltage Peak	1 mV … 1000 V	15 Hz … 850 Hz	0,2 %	
Noise on DC	1 mV … 10 V	1 Hz … 20 MHz	1,08 %	
DC Voltage	1 mV … 1000 V		0,1 %	

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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement uncertainty ± [1]	Remarks
AC Current RMS	0,1 A … 200 A	15 Hz … 500 Hz	0,3 %	
Rise- / Fall-Time DC, AC	100 ns … 500 us	0 V … 1000 V	< 2 ns	
Frequency	1 Hz … 10 kHz		0,012 %	
THD Voltage	10 Hz … 10 kHz		0,253 %	
Phase	0 ° … 360 °	1 Hz … 10 kHz	2 °	
Harmonics & Flicker Power Analyzer [2]				EN/IEC 61000-4-7, EN/IEC 61000-3-2, JIS C 61000-3-2, EN/IEC 61000-3-12
AC Voltage RMS	1 V … 1000 V	16 Hz … 10 kHz	0,32 %	
AC Current RMS	2.2 A … 80 A	10 Hz … 1 kHz	0,18 %	
AC Current RMS	1 mA … 2,2 A	10 Hz … 5 kHz	< 0,35 %	
THD Voltage	0 % … 10 %	16 Hz … 6kHz	0,32 %	
THD Current	0 % … 10 %	16 Hz … 6kHz	0,34 %	
Flicker [2]				
PST	0 … 5	Set values of CPM, dV/V as per standard	0,124 %	IEC 61000-4-15, IEC 61000-3-3, IEC 61000-3-11
dmax	0 % … 10 %	Use of procedure as per standard	1,0 %	
dc	0 % … 10 %	Use of procedure as per standard	1,0 %	
Tmax	0 s … 10s	Use of procedure as per standard	1,0 %	
Flicker Impedance [2]				IEC 61000-3-3, -11, IEC TR 60725
Flicker Impedance R	0,1 R … 0,5 R		< 0,118 %	
Flicker Impedance L	100 uH … 1 mH		< 0,118 %	
Flicker Impedance Z	0,1 R … 0,5 R		0,118 %	
Artificial Network [2]				ISO 7637-2, ISO 11452-4, CISPR 16-1-2, CISPR 25, GS 95002

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Impedance Absolute	0,5 Ω … 110 Ω	0,1 … 0,5 MHz	0,3 Ω	
	0,5 Ω … 110 Ω	0,5 … 1.0 MHz	0,3 Ω	
	0,5 Ω … 110 Ω	1,0 … 15 MHz	0.7 Ω	
	0,5 Ω … 110 Ω	15 … 100 MHz	0.7 Ω	
	0,5 Ω … 110 Ω	100 … 200 MHz	0.7 Ω	
Impedance Phase	0,1° … 120°	0,1 … 0,3 MHz	3.5 °	
	0,1° … 120°	0,3 … 10 MHz	1.2 °	
	0,1° … 120°	10 … 120 MHz	0.8 °	
	0,1° … 120°	120 … 200 MHz	0.9 °	
Isolation	0.0 … 70 dB	0,1 … 1.0 MHz	0,5 dB	
	0.0 … 70 dB	1.0 … 100 MHz	1.0 dB	
	0.0 … 70 dB	100 … 200 MHz	0.6 dB	
VDF	0.0 … 30 dB	0,1 … 200 MHz	0,5 dB	

All quantities: in/from[2)] both sites.

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