Hellenic Accreditation System

Annex F2/21 to the Certificate No. **90**-9

SCOPE of ACCREDITATION

of the

Calibration Laboratory

of the

PPC TESTING, INSPECTION AND CERTIFICATION SINGLE MEMBER S.A.

(PPC INSPECTRA)

Parameters/ Calibration Item	Range of measurment	Expanded measurement uncertainty (k=2)*	Remarks
Electrical Measurements			
DC Voltage (Measurement)/ Voltage standards, Voltage Calibrators and Sources		**parts per 10^6 output + µV**	Calibration according to (i) lab internal procedures, (ii) with standard multimeter. (iii) The calibration may also take place on site in the measurement range [1 – 10kV]
	[1 µV to 100 µV]	0 + 0,029	
	(100 µV to 1 mV]	0 + 0,042	
	(1 mV to 10 mV]	0 + 0,25	
	(10 mV to 120 mV]	5,0 + 0,3	
	(120 mV to 1,2 V]	4,0 + 0,8	
	1,018 V	0 + 0,74	
	(1,2 V to 12 V]	4,0 + 0,5	
	10 V	0 + 0,38	
	(12 V to 120 V]	6,0 + 30	
	(120 V to 1050 V]	6,0 + 100	
	[1 kV to 10 kV]	136 + 0	
DC Voltage (Generation)/ Voltage Measuring Equipment		**parts per 10^6 output + µV**	Calibration according to (i) Euramet cg-15 v.3.0:2015,(ii) with standard calibrator
	[1 µV to 100 µV]	0 + 0,01	
	(100 µV to 1 mV]	0 + 0,04	
	(1 mV to 5 mV]	0 + 0,17	
	(5 mV to 10 mV]	0 + 0,34	
	(10 mV to 220 mV]	6,5 + 0,8	
	(220 mV to 2,2 V]	4,0 + 0,8	
	1,018 V	0 + 0,74	
	(2,2 V to 12 V]	3,0 + 2,5	
	10 V	0 + 0,38	

	(12 V to 22 V] (22 V to 220 V] (220 V to 1100 V]	3,0 + 4 4,0 + 40 6,0 + 400	

Parameters/ Calibration Item	Range of measurment		Expanded measurement uncertainty (k=2)*	Remarks
AC Voltage (Measurement)/ Voltage standards, Voltage Calibrators and Sources			**parts per 10^6 output + µV**	Calibration according to (i) lab internal procedures, (ii) with standard multimeter
	(12 mV to 12 V]	[1 Hz to 40 Hz]	0,007 + 0,004	
		(40 Hz to 1 kHz]	0,007 + 0,002	
		(1 kHz to 20 kHz]	0,014 + 0,002	
		(20 kHz to 50 kHz]	0,03 + 0,002	
		(50 kHz to 100 kHz]	0,08 + 0,002	
		(100 kHz to 300 kHz]	0,3 + 0,01	
		(300 kHz to 1 MHz]	1 + 0,01	
		(1 MHz to 2 MHz]	1,5 + 0,01	
		(2 MHz to 4 MHz]	4 + 0,07	
		(4 MHz to 8 MHz]	4 + 0,08	
		(8 MHz to 10 MHz]	15 + 0,1	
	(12 V to 120 V]	[1 Hz to 40 Hz]	0,02 + 0,004	
		(40 Hz to 1 kHz]	0,02 + 0,002	
		(1 kHz to 20 kHz]	0,02 + 0,002	
		(20 kHz to 50 kHz]	0,035 + 0,002	
		(50 kHz to 100 kHz]	0,12 + 0,002	
		(100 kHz to 300 kHz]	0,4 + 0,01	
		(300 kHz to 1 MHz]	1,5 + 0,01	
	(120 V to 700 V]	[1 Hz to 40 Hz]	0,04 + 0,004	
		(40 Hz to 1 kHz]	0,04 + 0,002	
		(1 kHz to 20 kHz]	0,06 + 0,002	
		(20 kHz to 50 kHz]	0,12 + 0,002	
		(50 kHz to 100 kHz]	0,3 + 0,002	
			% Reading	Calibration (i) according to lab internal procedures, (ii) with standard multimeter and standard AC divider. (iii) The calibration may also take place on site
	[0,7 kV to 3 kV)	[50 Hz to 60 Hz]	0,58	
	[3 kV to 7 kV]	[50 Hz to 60 Hz]	0,21	
			parts per 10^6 output + µV	
	[220 µV to 2,2 mV)	[10 Hz to 20 Hz]	230 + 4	

Parameters/ Calibration Item	Range of measurment		Expanded measurement uncertainty (k=2)*	Remarks
AC Voltage (Generation)/ Voltage Measuring Equipment		(20 Hz to 40 Hz]	87 + 4	Calibration according to (i) Euramet cg-15 v.3.0:2015, (ii) with standard calibrator
		(40 Hz to 20 kHz]	77 + 4	
		(20 kHz to 50 kHz]	190 + 4	
		(50 kHz to 100 kHz]	480 + 5	
		(100 kHz to 300 kHz]	1000 + 10	
		(300 kHz to 500 kHz]	1300 + 20	
		(500 kHz to 1 MHz]	2600 + 20	
	[22 mV to 220 mV]	[10 Hz to 20 Hz]	230 + 12	
		(20 Hz to 40 Hz]	87 + 7	
		(40 Hz to 20 kHz]	77+ 7	
		(20 kHz to 50 kHz]	190 + 7	
		(50 kHz to 100 kHz]	440 + 17	
		(100 kHz to 300 kHz]	800 + 20	
		(300 kHz to 500 kHz]	1300 + 25	
		(500 kHz to 1 MHz]	2600 + 45	
	(220 mV to 2,2 V]	[10 Hz to 20 Hz]	230 + 40	
		(20 Hz to 40 Hz]	85 + 15	
		(40 Hz to 20 kHz]	42 + 8	
		(20 kHz to 50 kHz]	73 + 10	
		(50 kHz to100 kHz]	107 + 30	
		(100 kHz to 300 kHz]	380 + 80	
		(300 kHz to 500 kHz]	950 + 200	
		(500 kHz to 1 MHz]	1600 + 300	

Parameters/ Calibration Item	Range of measurment		Expanded measurement uncertainty (k=2)*	Remarks
			parts per 10^6 output + µV	
	(2,2 V to22 V]	[10 Hz to 20 Hz]	230 + 400	
		(20 Hz to 40 Hz]	85 + 150	
		(40 Hz to 20 kHz]	42 + 50	
		(20 kHz to 50 kHz]	73 + 100	
		(50 kHz to 100 kHz]	97 + 200	
		(100 kHz to 300 kHz]	270 + 600	
		(300 kHz to 500 kHz]	900 + 2000	
		(500 kHz to 1 MHz]	1400 + 3200	
(continued) **AC Voltage (Generation)**/ Voltage Measuring Equipment	(22 V to220 V]	[10 Hz to 20 Hz]	230 + 4000	Calibration according to (i) Euramet cg-15 v.3.0:2015, (ii) with standard calibrator
		(20 Hz to 40 Hz]	85 + 1500	
		(40 Hz to 20 kHz]	50 + 600	
		(20 kHz to 50 kHz]	77 + 1000	
		(50 kHz to 100 kHz]	140 + 2500	
		(100 kHz to 300 kHz]	850 + 16000	
		(300 kHz to 500 kHz]	4300 + 40000	
		(500 kHz to 1 MHz]	7500 + 80000	
	(220 V to1100 V]	[50 Hz to 1 kHz]	65 + 3500	
		(1 kHz to 20 kHz]	135 + 6000	
		(20 kHz to 30 kHz]	440 + 11000	
	to 750 V]	(30 kHz to 50 kHz]	440 + 11000	
		(50 kHz to 100 kHz]	1600 + 45000	
DC Current (Measurement)/ Current Calibrator and Soursces			**parts per 10^6 Reading + parts per 10^6 Range**	Calibration according to (i) lab internal procedures, (ii) with standard multimeter and standard Shunt resistances
	[10 nA to 120 nA)		30 + 400	
	[0,12 µA to 1,2 µA)		20 + 40	
	[1,2 µA to 12 µA)		20 + 10	
	[12 µA to 120 µA)		20 + 8	
	[0,12 mA to 1,2 mA)		20 + 5	
	[1,2 mA to 12 mA)		20 + 5	
	[12 mA to 120 mA)		35 + 5	
	[0,12 A to 1,05 A)		110 + 10	
	[1,05 A to 200 A]		240 + 0	
DC Current (Generation)/ Current measuring Equipment			**parts per 10^6 output + nA**	Calibration according to (i) Euramet cg-15 v.3.0:2015, (ii) with standard calibrator and standard current coil multiplier
	[10 µA to 220 µA)		37 + 6	
	[0,22 mA to 2,2 mA)		33 + 7	
	[2,2 mA to 22 mA)		33 + 40	
	[22 mA to 220 mA)		42 + 700	
	[0,22 A to 2,2 A)		70 + 12000	
	[2,2 A to 11 A]		350 + 480000	

Parameters/ Calibration Item	Range of measurment		Expanded measurement uncertainty (k=2)*	Remarks
Current Clamp Type Measuring Equipment			**% Reading**	
	[10 A to 1000 A]		0,33	
AC Current (Measurement)/ Current Calibrator and Sources			**% Reading + % Range**	Calibration according to (i) lab internal procedure, (ii) with standard multimeter and standard Shunt/ Rogowski. (iii) The calibration may also take place on site
	[10 μA to120 μA)	[10 Hz to 20 Hz)	0,4 + 0,03	
		[20 Hz to 45 Hz)	0,15 + 0,03	
		[45 Hz to 1 kHz]	0,06 + 0,03	
	[0,12 mA to120 mA)	[10 Hz to 20 Hz)	0,4 + 0,02	
		[20 Hz to 45 Hz)	0,15 + 0,02	
		[45 Hz to 100 Hz)	0,06 + 0,02	
		[100 Hz to 5 kHz)	0,03 + 0,02	
		[5 kHz to 20 kHz)	0,06 + 0,02	
		[20 kHz to 50 kHz)	0,4 + 0,04	
		[50 kHz to 100 kHz]	0,55 + 0,15	
	[120 mA to 1,05 A]	[10 Hz to 20 Hz)	0,4 + 0,02	
		[20 Hz to 45 Hz)	0,16 + 0,02	
		[45 Hz to 100 Hz)	0,08 + 0,02	
		[100 Hz to 5 kHz)	0,1 + 0,02	
		[5 kHz to 20 kHz)	0,3 + 0,02	
		[20 kHz to 50 kHz]	1 + 0,04	
	[20 A to 100 A)	50 Hz	3,5 + 0	
	[100 A to 700 A]	50 Hz	0,76 + 0	
	(700 A to 1000 A]	50 Hz	1,89 + 0	
	[1 kA to 10 kA]	[50 to 60 Hz]	1,10 + 0	
AC Current (Generation)/ Current measuring Equipment			**parts per 10^6 output + nA**	Calibration according to (i) Euramet cg-15 v.3.0:2015, (ii) with standard calibrator and standard current coil multiplier
	[0,22 mA to2,2 mA)	[10 Hz to 20 Hz)	240 + 16	
		[20 Hz to 40 Hz)	150 + 10	
		[40 Hz to 1 kHz)	115 + 8	
		[1 kHz to 5 kHz)	270 + 12	
		[5 kHz to 10 kHz]	1000 + 65	
	[2,2 mA to 22 mA)	[10 Hz to 20 Hz)	240 + 40	
		[20 Hz to 40 Hz)	150 + 35	
		[40 Hz to 1 kHz)	115 + 35	
		[1 kHz to 5 kHz)	190 + 110	
		[5 kHz to 10 kHz]	1000 + 650	

	[0,22 mA to 2,2 mA)	[10 Hz to 20 Hz)	240 + 400	
		[20 Hz to 40 Hz)	150 + 350	
		[40 Hz to 1 kHz)	115 + 350	
		[1 kHz to 5 kHz)	190 + 550	
		[5 kHz to 10 kHz]	1000 + 5000	
Parameters/ Calibration Item	Range of measurment		Expanded measurement uncertainty (k=2)*	Remarks
(continued) **AC Current (Generation)**/ Current Measuring Equipment			**parts per 10^6 output + µA**	Calibration according to (i) Euramet cg-15 v.3.0:2015, (ii) with standard calibrator and standard current coil multiplier
	[22 mA to 220 mA)	[10 Hz to 20 Hz)	240 + 4	
		[20 Hz to 40 Hz)	150 + 3,5	
		[40 Hz to 1 kHz)	115 + 2,5	
		[1 kHz to 5 kHz)	190 + 3,5	
		[5 kHz to 10 kHz]	1000 + 10	
	[220 mA to 2,2 A)	[20 Hz to 1 kHz)	250 + 35	
		[1 kHz to 5 kHz)	420 + 80	
		[5 kHz to 10 kHz]	6500 + 160	
	[2,2 A to 11 A]	[40 Hz to 1 kHz)	440 + 170	
		[1 kHz to 5 kHz)	900 + 380	
		[5 kHz to 10 kHz]	3500 + 750	
Current Clamp Type Measuring Equipment			**% Reading**	
	[10 A to 100 A)	50 Hz	3,2	
		(50 Hz to 400 Hz]	8,4	
	[100 A to 400 A]	50 Hz	0,32	
		(50 Hz to 400 Hz]	0,86	
	(400 A to 1000 A]	50 Hz	0,08	
Resistance DC (Generation)/ Resistance Measuring Equipment			**parts per 10^6**	Calibration according to(i) Euramet cg-15 v.3.0:2015, (ii) with standard shunt resistances or standard calibrator
	0 Ω		40 µΩ	
	[1 µΩ to 10 µΩ]		42	
	(10 µΩ to 100 µΩ]		23	
	(100 µΩ to 1 mΩ]		19	
	(1 mΩ to 100 mΩ]		13	
	(100 mΩ to 1,9 Ω]		85	
	(1,9 Ω to 19 Ω]		22	
	(19 Ω to 190 Ω]		9,5	
	(190 Ω to 1,9 kΩ]		8,0	
	(1,9 kΩ to 10 kΩ]		85	
	(10 kΩ to 19 kΩ]		8,0	
	(19 kΩ to 190 kΩ]		10	
	(190 kΩ to 1 MΩ]		17	
	(1 MΩ to 1,9 MΩ]		18	
	(1,9 MΩ to 10 MΩ]		34	
	(10 MΩ to 19 MΩ]		42	
	(19 MΩ to 100 MΩ]		100	
	1 GΩ		5900	
	10 GΩ		1100	

	100 GΩ			4800	
Parameters/ Calibration Item	Range of measurement			Expanded measurement uncertainty (k=2)*	Remarks
Resistance DC (Measurement) / Standards Resistors				**parts per 10^6**	
	[1 μΩ to 10 μΩ)			3000	Calibration according to (i) lab internal procedure (ii)with standard calibrator, standard multimeter and shunt resistances
	[10 μΩ to 100 μΩ)			380	
	[100 μΩ to 1 mΩ)			180	
	[1 mΩ to 10 mΩ)			60	
	[10 mΩ to 100 mΩ)			10	
	[100 mΩ to 1 Ω]			7,3	
	(1 Ω to 10 Ω]			7,3	
	(10 Ω to 100 Ω)			11	
	[100 Ω to 1 kΩ)			11	
	[1 kΩ to 10 kΩ]			11	
	(10 kΩ to 100 kΩ]			11	
	(100 kΩ to 1 MΩ]			10	
	(1 MΩ to 10 MΩ]			38	
	(10 MΩ to 100 MΩ]			79	
	(100 MΩ to 1 GΩ]			5900	
	(1 GΩ to 10 GΩ]			500	Calibration according to (i) lab internal procedure, (ii) with standard calibrator and standard multimeter
	(10 GΩ to 100 GΩ]			4660	
Resistance AC (Measurement) / Standards Resistors	10 Ω	[220 μA to 2,2 mA]	[50 Hz to 125 Hz]	290	Calibration according to (i) lab internal procedures, (ii) with standard calibrator and standard multimeter
	[100 Ω to 10 kΩ]			180	
	1 Ω	[2,2 mA to 22 mA]		290	
	[10 Ω to 1 kΩ]			180	
	100 mΩ	[22 mA to 220 mA]		240	
	[1 Ω to 100 Ω]			180	
	10 mΩ	[220 mA to 2,2 A]		340	
	[100 mΩ to 10 Ω]			300	
	[10 mΩ to 100 mΩ]	[2,2 A to 11 A]		470	
Resistance AC (Generation)/ Resistance Measuring Equipment	10 mΩ	10 A	[50 Hz to 125 Hz]	1600	Calibration according to (i)lab internal procedures, (ii) with standard resistances
	100 mΩ	3 A		840	
	1 Ω	1,4 A		12000	
	10 Ω	100 mA		1300	
	100 Ω	20 mA		680	
	1 kΩ	10 mA		680	
	10 kΩ	3 mA		790	

* Where the expanded uncertainty (with 95% coverage) is accompanied by the corresponding unit, it is absolute, while where it is not accompanied by a unit, it is relative.

The Calibration Measurement Capability (CMC), includes the measured quantity, the measurement range and the measurement uncertainty, expressing the minimum measurement uncertainty which can be achieved in a calibration.

Permanent laboratory premises address: **9 Leontariou Str, 15351 Kantza, Pallini, Attiki, Greece.**
Approved signatories: **M. Valsamakis,-A. Petrakos, K. Stampolas.**

This Scope of Accreditation replaces the previous one dated 24.01.2025.
The Accreditation Certificate No. **90**-9 to ELOT EN ISO/IEC 17025: 2017, is valid until 02.07.2027.

Athens, 23.06.2025

Konstantinou Evangelos Apostolos
CEO of ESYD