

Hellenic Accreditation System



Annex F2/20 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 measurement	Expanded measurement uncertainty (k=2)*	Remarks
DC Voltage (Measurement)/ Voltage Standards, Voltage Calibrators and Sources		parts per 10⁶ output + μV	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	[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 + 0		
DC Voltage (Generation)/ Voltage Measuring Equipment	[1 μV to 100 μV]	0 + 0.01	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	(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]	3.0 + 4	
(22 V to 220 V]	4.0 + 40		
(220 V to 1100 V]	6.0 + 400		

Parameters/ Calibration Item	Range of measurement	Expanded measurement uncertainty (k=2)*	Remarks
AC Voltage (Measurement)/ Voltage Standards, Voltage Calibrators and Sources	(12 mV to 12 V] [1 Hz to 40 Hz]	0.007 + 0.004	Calibration according to (i) EURAMET eg 15, (ii) standards of lab, (iii) lab internal procedures
	(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 + V	
[0.7 kV to 3 kV) [50 Hz to 60Hz]	0.577 + 0		
[3 kV to 7 kV) [50 Hz to 60Hz]	0.211 + 0		

Parameters/ Calibration Item	Range of measurement	Expanded measurement uncertainty (k=2)*	Remarks
AC Voltage (Generation)/ Voltage Measuring Equipment		parts per 10⁶ output + μV	
	[220 μV to 2.2 mV] [10 Hz to 20 Hz]	230 + 4	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	(20 Hz to 40 Hz]	87 + 4	
	(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	
	[2.2 mV to 22 mV] [10 Hz to 20 Hz]	230 + 4	
	(20 Hz to 40 Hz]	87 + 4	
	(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 to 100 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 measurement	Expanded measurement uncertainty (k=2)*	Remarks
		parts per 10⁶ output + μV	
	(2.2 V to 22 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 to 220 V) [10 Hz to 20 Hz]	230 + 4000	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	(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 to 1100 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	
		parts per 10⁶ Reading + parts per 10⁶ Range	
DC Current (Measurement) / Current Calibrators and Sources	[10 nA to 120 nA)	30 + 400	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	[0.12 μ A to 1.2 μ A)	20 + 40	
	[1.2 μ A to 12 μ A)	20 + 10	
	[12 μ A to 120 μ A)	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		
		parts per 10⁶ output + nA	
DC Current (Generation)/ Current Measuring Equipment	[10 μ A to 220 μ A)	37 + 6	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	[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 measurement	Expanded measurement uncertainty (k=2)*	Remarks		
Current Clamp Type Measuring Equipment		% Reading + mA			
	[10 A to 1000 A]	0.326 + 0			
AC Current (Measurement)/ Current Calibrators and Sources		% Reading + % Range	Calibration according to (i) EURAMET cg-15, (ii) standards of lab, (iii) lab internal procedures		
	[10 µA to 120 µA)	[10 Hz to 20 Hz) [20 Hz to 45 Hz) [45 Hz to 1 kHz]		0.4 + 0.03 0.15 + 0.03 0.06 + 0.03	
	[0.12 mA to 120 mA)	[10 Hz to 20 Hz) [20 Hz to 45 Hz) [45 Hz to 100 Hz) [100 Hz to 5 kHz) [5 kHz to 20 kHz) [20 kHz to 50 kHz) [50 kHz to 100 kHz]		0.4 + 0.02 0.15 + 0.02 0.06 + 0.02 0.03 + 0.02 0.06 + 0.02 0.4 + 0.04 0.55 + 0.15	
	[120 mA to 1.05 A)	[10 Hz to 20 Hz) [20 Hz to 45 Hz) [45 Hz to 100 Hz) [100 Hz to 5 kHz) [5 kHz to 20 kHz) [20 kHz to 50 kHz]		0.4 + 0.02 0.16 + 0.02 0.08 + 0.02 0.1 + 0.02 0.3 + 0.02 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 10⁶ output + nA	Calibration according to (i) EURAMET cg-15, (ii) standards of lab, (iii) lab internal procedures
		[0.22 mA to 2.2 mA)		[10 Hz to 20 Hz) [20 Hz to 40 Hz) [40 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]	
[2.2 mA to 22 mA)		[10 Hz to 20 Hz) [20 Hz to 40 Hz) [40 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]	240 + 40 150 + 35 115 + 35 190 + 110 1000 + 650		
[0.22 mA to 2.2 mA)		[10 Hz to 20 Hz) [20 Hz to 40 Hz) [40 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]	240 + 400 150 + 350 115 + 350 190 + 550 1000 + 5000		

Parameters/ Calibration Item	Range of measurement	Expanded measurement uncertainty (k=2)*	Remarks		
(continued) AC Current (Generation)/ Current Measuring Equipment		parts per 10⁶ output + μA	Calibration according to (i) EURAMET cg-15, (ii) standards of lab, (iii) lab internal procedures		
	[22 mA to 220 mA)	[10 Hz to 20 Hz) [20 Hz to 40 Hz) [40 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]		240 + 4 150 + 3.5 115 + 2.5 190 + 3.5 1000 + 10	
	[220 mA to 2.2 A)	[20 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]		250 + 35 420 + 80 6500 + 160	
	[2.2 A to 11 A]	[40 Hz to 1 kHz) [1 kHz to 5 kHz) [5 kHz to 10 kHz]		440 + 170 900 + 380 3500 + 750	
				% Reading + A	
	[10 A to 100 A)	50 Hz (50 Hz to 400 Hz]		3.2 + 0 8.4 + 0	
	[100 A to 400 A]	50 Hz (50 Hz to 400 Hz]		0.32 + 0 0.86 + 0	
	(400 A to 1000 A]	50 Hz		0.083 + 0	
	Resistance DC (Generation)/ Resistance Measuring Equipment			parts per 10⁶	Calibration according to (i) EURAMET cg-15, (ii) standards of lab, (iii) lab internal procedures
		0 Ω		40 $\mu\Omega$	
10 $\mu\Omega$		42			
100 $\mu\Omega$		23			
1 m Ω		19			
10 m Ω		13			
100 m Ω		13			
1 Ω		85			
1.9 Ω		85			
10 Ω		22			
19 Ω		22			
100 Ω		9.5			
190 Ω		9.5			
1 k Ω		8.0			
1.9 k Ω		8.0			
10 k Ω		85			
19 k Ω		8.0			
100 k Ω		10			
190 k Ω		10			
1 M Ω		17			
1.9 M Ω	18				
10 M Ω	34				
19 M Ω	42				
100 M Ω	100				

Parameters/ Calibration Item	Range of measurement		Expanded measurement uncertainty (k=2)*	Remarks	
Resistance DC (Measurement)/ Standard Resistors			parts per 10⁶	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures	
	[1 μΩ to 10 μΩ]		3000		
	[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			
Resistance AC (Measurement)/ Standard Resistors	10 Ω	[220 μA to 2.2 mA]	[50 Hz to 125 Hz]	290	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	[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			
Resistance AC (Generation)/ Resistance Measuring Equipment	[10 mΩ to 100 mΩ]	[2.2 A to 11 A]		470	Calibration according to (i) EURAMET cg- 15, (ii) standards of lab, (iii) lab internal procedures
	10 mΩ	10 A	[50 Hz to 125 Hz]	1600	
	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.

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Approved signatories: **M. Bomboulos, D. Kaimaras, M. Valsamakis, E. Thirios, A. Petrakos.**

This Scope of Accreditation replaces the previous one dated 11.09.2024.

The Accreditation Certificate No. **90-9**, to ELOT EN ISO/IEC 17025:2017, is valid until **02.07.2027**.

Athens, 24.01.2025



Konstantinou Evangelos Apostolos
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