Hellenic Accreditation System

Annex F2/9 to the Certificate No. **547**-5

SCOPE of ACCREDITATION

of the

Renewable Energy Laboratory

of

INTERNATIONAL WINDENGINEERING G.P.

for the performance of calibrations

Measurand / Calibration item	Range of measurement	Calibration & Measurement Capability (k=2) *	Remarks
Air speed measurements			
Ταχύτητα αέρα / Cup anemometers, uniaxial propeller anemometers, ultrasonic anemometer, hot wires/films, air flow meters - Directly indicating transmitters. Transmitters with analog output 0 … 20 mA, 0 … 10 V DC - Transmitters with digital output	4 m/s … 16 m/s	0,13 m/s (at 4m/s) 0,08 m/s (at 10m/s) 0,10 m/s (at 16m/s)	IEC61400-12-1: 2017, Annex F Calibration is performed in a closed circuit wind tunnel
	1 m/s … 30 m/s	0,19 m/s (at 1 m/s) 0.16 m/s (at 2m/s) (for speeds 4 – 16 m/s, see uncertainties above) 0.14 m/s (at 20m/s) 0.19 m/s (at 30m/s)	Calibration according to internal method CLP-07 based on: IEC61400-12-1: 2017, Annex F Calibration is performed in a closed circuit wind tunnel
Wind direction measurements			
Wind direction / Wind direction sensors: - Potentiometric sensors with voltage measurement - Sensors with serial output - Sensors connected to conditioning modules - Sensors connected to digital/analogue devices (ultrasonic anemometers, hot-wire anemometers, propeller anemometers)	0°… 360°	0,8°	IEC61400-12-1:2017, Annex N Calibration is performed in a closed circuit wind tunnel

Measurand / Calibration item	Range of measurement	Calibration & Measurement Capability (k=2) *	Remarks
Temperature measurements			
Temperature / Temperature transducers with analog output in mV or mA	-20°C…90°C	38 mK	Comparative calibration according to internal method CLP-05 based on: DKD-R-5-1: 2018 using bath and reference Pt thermometer
Pressure measurements			
Pressure / Pressure transducers with analog output in mV or mA	500 … 1100 hPa	±0,21 hPa	Comparative calibration according to internal method CLP-08 based on: DKD-R 6-1: 2014 using reference barometer and controlled pressure chamber
Electrical Measurements			
DC Voltage / Recorders, multimeters, DC voltage measuring equipment	1µV … 100mV	0,0050%Voltage + 3,5 µV	Comparative calibration according to internal method CLP10-02 based on: EURAMET cg15, v.3: 2015
	>100mV … 1V	0,0035%Voltage + 7 µV	
	>1V … 10V	0,0030%Voltage + 0,05 mV	
	>10V … 30V	0,0040%Voltage + 0,6 mV	
DC Current / Recorders, multimeters, DC current measuring equipment	100 µA	0,05%Amperage + 0,025 µA	
	>100µA … 1 mA	0,05%Amperage + 0,06 µA	
	>1mA … 10 mA	0,05%Amperage + 2 µA	
	>10mA …20 mA	0,05%Amperage + 5 µA	
Frequency / Recorders, multimeters, DC frequency measuring equipment	1 … 500 Hz	0,2 Hz	

** Where uncertainty is accompanied by the corresponding unit, it is absolute, while where it is not accompanied by a unit, it is relative.*

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Site of assessment: **Permanent laboratory premises, Theotokopoulou 24, 153 44 Gerakas, Attiki, Greece and wind tunnel of NTUA**

Approved signatories: **E. Morfiadakis, K. Papadopoulos**

This Scope of Accreditation replaces the previous one dated May 18th, 2021.

The Accreditation Certificate No. **547**-5, to ELOT EN ISO/IEC 17025: **2017**, is valid until 18.5.2025.

Athens, July 28th, 2021

Spyridon Podaras
CEO of ESYD