

MEASUREMENT EQUIPMENT LABORATORY AP 063

Information card No 2

CALIBRATION of the measurement equipment in the scope of accreditation

The Calibration Laboratory is running at present, in the scope of accreditation, the above service for a wide assortment of measuring apparatus, with special consideration of the following groups of instruments and electrical quantities measuring devices:

- ammeters (laboratory and panel meters),
- voltmeters (laboratory and panel meters),
- wattmeters (laboratory and panel meters),
- varimeters (laboratory and panel meters),
- laboratory multimeters,
- multimeters with the ranges for measuring capacity, frequency and temperature,
- universal meters (analog, digital),
- meters for resistance measurement (bridges included),
- resistors (controllable, constant, shunts),
- DC voltage and DC currents sources,
- device meters of parameters defined with electric quantities of voltage, current and resistance.

The Laboratory commenced the activity associated with metrology many years ago, in other organizational structures, dealing at the beginning with the legalization of measuring equipment.

Conducting this activity for many years, including outside requirements updated in this period, the laboratory successively adapted the scope of its offer to the current needs and expectations of Customers.

Fulfilling them one by one, in February 2004 the laboratory obtained the status of the accredited calibration laboratory and the Certificate of Accreditation No. AP 063 issued by the Polish Centre for Accreditation in compliance with the requirements of the PN-EN ISO/IEC 17025:2001 standard,

The requirements of the accreditation precisely determine the methods and scopes of the measuring equipment calibration and allow for issuing Certificates of Calibration of precisely established content and form.

The expiry date of the Certificate of Accreditation No. AP 063, in compliance with the requirements of the PN-EN ISO/IEC 17025:2005 standard, was extended again to 2016.

Generally, we perform all works concerning calibration in the stationary laboratory, localized at the company head office but where justified, after reaching an agreement with the Customer and after double-sided approval of work conditions we also reach places of installation of the equipment.

We have at our disposal first-class measuring standards of such companies as: Tettex, Tinsley, Inmel, Calmet, Hameg, Fluke, Phenix, providing measuring cohesion with the national standards of units of measure.

Our engineering and technical staff, accredited and having suitable education, qualifications and long-standing experience is a guarantor of the performance of services on the required level.

All questions should be directed to:

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The selected details of the scope of accreditation

Name of physical quantity and type of measuring instrument		Measuring range	Measurement Capability CMC	Category of the Laboratory	Notes
7. Electrical quantities DC and LF					
7.01	DC voltage				
	- analog and digital voltmeters - multimeters	10 mV ÷ 200 mV 200 mV ÷ 1000 mV	0,05 % 0,03 %	S, P	S – stationary P – away from the registered office
	- stabilized power supplies - voltage sources	0 V ÷ 30 V	0,3 %	S, P	
7.01	DC current				
	- analog and digital ammeters - multimeters	0,1 mA ÷ 10 A 10 ÷ 20 A	0,1 % 0,7 %	S, P	
	- stabilized power supplies	0 ÷ 20 A	0,5 %	S	indirect method
	- current sources	0 ÷ 24 mA	0,05 %	S, P	
7.02	AC voltage				
	- analog and digital voltmeters - multimeters	10 mV ÷ 200 mV 200 mV ÷ 1000 V	0,2 % 0,1 %	S, P	AC (50 Hz)
7.02	AC current				
	- analog and digital ammeters - multimeters	0,1 mA ÷ 1 A 1 ÷ 10 A 10 ÷ 20 A 20 A ÷ 150 A	0,3 % 0,1 % 0,7 % 0,2 %	S, P	AC (50 Hz)
7.03	DC resistance				
	- constant resistors - shunts	0,0001 Ω 0,001Ω; 0,01Ω; 0,1Ω; 0,3Ω; 1Ω; 10Ω; 100Ω; 1000Ω; 10000Ω	0,05 % 0,005 %	S	substitution method
	- constant and controllable resistors - shunts	0,0001 ÷ 1 Ω 1 Ω ÷ 1 MΩ	0,1 % 0,06 %	S	
	- analog and digital ohmmeters - multimeters - bridges	0,0001 ÷ 2 Ω 2 Ω ÷ 20 MΩ 20 MΩ ÷ 10 GΩ	0,1 % 0,2 % 0,5 %	S	
7.06	capacity				
	- multimeters	0,001 ÷ 0,01 μF 0,01 ÷ 100 μF	0,02 nF 0,6 %	S	
7.09	power				
	- analog and digital power meters (single-phase and three-phase)	(30 ÷ 500) V; (0,1 ÷ 50)A	0,1 %	S, P	f = 50 Hz for PF=1 apparent power also for PF = 0 varmeters also
7.10	high voltage and current				
	- voltage testers	(0,5 ÷ 20) kV (20 ÷ 100) kV	2,5 % 2,0 %	S, P	f = 50 Hz
10. Time and frequency					
10.02	frequency				
	- multimeters	10 Hz ÷ 10 MHz	0,001 %	S, P	
19. Temperature					
19.01	electrical thermometry				
	temperature indicators (meters) ¹	-50 ÷ 1350 °C ²⁾	1,5 °C ²⁾	S, P	indirect method ²⁾

¹⁾ Measurement capability CMC constitutes the expanded uncertainty for the coverage factor $k = 2$, that corresponds to the confidence level of about 95 %. The value expressed in the per cent regards the percentage share of the value of the measured quantity. In other cases CMC is expressed in units of the value of the measured quantity.

²⁾ Indirect calibrating with the application of standardized thermometric characteristics given in the standard PN-EN 60584-1:1997 Thermoelements – Characteristics.

No.	Accredited Measurement Procedures	Designation	Status of edition	Reference documents
1.	Calibration of analog measurement instruments	PP-01	edition 5; 2010.03.29	The standard: PN-EN ISO/IEC 17025. Bases of the theory of measurements. Publications in the scope of metrology. The staff experience in the field of measurement and calibrating, documented for many years.
2.	Calibration of digital measurement instruments	PP-02	edition 4; 2010.03.29	
3.	Calibration of resistance elements	PP-03	edition 4; 2010.03.29	
4.	Calibration of electrical quantity sources	PP-04	edition 5; 2010.03.29	
5.	Calibration of laboratory bridges for resistance measurement	PP-05	edition 4; 2010.03.29	
6.	Calibration with the comparative method	PP-06	edition 4; 2010.03.29	
7.	Calibration of high voltage test systems	PP-07	edition 1; 2011.06.10	