

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 036
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Accreditation No: LAB 036

Awarded to

APPLIED PHYSICS COMPUTERS AND INSTRUMENTATION CENTRE (APC&IC)

**Pakistan Council of Scientific & Industrial Research (PCSIR)
Laboratories Complex. Lahore 54600, Pakistan.**

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **24-08-2006** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **16-06-2022**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

PAKISTAN NATIONAL ACCREDITATION COUNCIL

14-09-2020

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Director General

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Calibration Laboratory.

Accreditation Scope of APPLIED PHYSICS COMPUTERS AND INSTRUMENTATION CENTRE (APC&IC)

Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories Complex.
Lahore 54600, Pakistan.

Permanent laboratory premises

Field of Measurement:			
Measured quantity	Range	*Expanded Uncertainty (±)	Technique, Reference Standard, Equipment
Volume Measures (ASTM E-542)			
Pipettes Burettes	0.01 mL to 100 mL	0.0010 mL- 0.50 mL	Cal.Lab-M25 Class F2 Weighing Scale
Measuring Cylinders	1 mL to 2000 mL	0.010 mL - 10 mL	Cal.Lab-M24 Class E2 Weighing Scale
Measuring Beakers/ Flasks/jugs	10 L to 2000 mL 1 L to 5 L	0.10 mL - 5 mL 0.0050 L to 0.050 L	Cal.Lab-M24 Class E2 Weighing Scale
Micro Pipettes	10 µL to 1000 µL	0.60 µL to 10 µL	Cal.Lab-M25 Class F2 Weighing Scale
Masses and Weighing Balances			
Weighing Scales Weighing Scales Class I and Below Accuracy Classes	Up to 200 g	0.00010 g	E2 Class Mass(Cal-Lab-24)
	Up to 500 g	0.0010 g	E2 Class Mass(Cal-Lab-24)
	Up to 20 kg	0.00010 kg	F2 Class Mass(Cal-Lab-26)
Masses NIMT CP-301 F1 Class & Below	1 mg to 200 mg	0.060 mg	E2 Class Mass(Cal-Lab-24)
	500 g to 20 kg	0.00010 kg	F2 Class Mass(Cal-Lab-26) & Cal-Lab-32
Temperature Measurement			
Digital Thermometer EURAMET cg-13 & 8	-50 °C to 350 °C 350 °C to 600 °C 600 °C to 800 °C	0.20 °C 0.30 °C 1.0 °C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k- type Thermocouple (Cal. Lab-

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			T34 & T2), Temperature Controllers (Cal. Lab-TC1, TC2 & TC3), Dry Well Calibrator (Cal. Lab-T16)
Liquid in glass Thermometer EA-10/11 & 13	-50 °C to 100 °C 100 °C to 350 °C	0.20 °C 1.0 °C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k-type Thermocouple (Cal. Lab-T34 & T2), Dry Well Calibrator (Cal. Lab-T16)
Digital Thermometer EURAMET cg-13 & 8	-50 °C to 350 °C 350 °C to 600 °C 600 °C to 800 °C	0.20 °C 0.30 °C 1.0 °C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k-type Thermocouple (Cal. Lab-T34 & T2), Temperature Controllers (Cal. Lab-TC1, TC2 & TC3), Dry Well Calibrator (Cal. Lab-T16)
Temperature Source			
Dry Block Calibrator / Temperature Calibrator EURAMET cg-13 & 8	-50 °C to 100 °C 100 °C to 600 °C	0.20 °C 0.80 °C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k-type Thermocouple (Cal. Lab-T34 & T2),
Environmental Chambers EA-10/08	-40 °C to 100 °C 100 °C to 300 °C	0.20 °C 0.80 °C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k-type Thermocouple (Cal. Lab-T34 & T2), Temperature Controllers (Cal. Lab-TC1, TC2 & TC3)
Muffle Furnace EA-10/08	200 °C to 1000 °C	1.0 °C	Precision Thermometer with k-type Thermocouple (Cal. Lab-T34 & T2)
Temperature Measurement by Simulation Method (EURAMET cg-11)			
RTD Pt 100	-100 °C to 800 °C	0.20 °C	Fluke 8508A Reference Multimeter (Cal. Lab- E67)
Thermocouple Type "k"	-200 °C to 1200 °C	0.20 °C to 1.0 °C	Portable Calibrator (Cal. Lab-E2), Fluke 8508A Reference Multimeter (Cal. Lab- E67)
Thermocouple Type "j"	-200 °C to 1200 °C	0.20 °C to 1.0 °C	
Pressure			
Pressure Gauge Pneumatic	2 psi to 250 psi	0.30 psi	Pressure Calibrator (Cal.Lab-P30)

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Pressure Gauge Hydraulic	500 psi to 8000 psi	12 psi	Dead Weight Tester (Cal.Lab-P17 & Pressure Gauge (Cal.Lab-P27))
Vacuum Gauge	20 mm of Hg to 700 mm of Hg	12 mm of Hg	Vacuum Gauge (Cal.Lab-P3)
Dimensional Measure			
Line Length Standard	1 cm to 100 cm	0.10 cm	Line Length Standard (Cal.Lab-L2)
Measuring Tape	5 cm to 500 cm	0.10 cm	Measuring Tape (Cal.Lab-L5)
Vernier Caliper	0.5 mm to 300 mm	0.010 mm	Mitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab-L13)
Outside Micrometer	0.5 mm to 25 mm	0.0010 mm	Mitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab-L13)
Gauge Blocks	0.5 mm to 100 mm	0.40 μ m	Mitutoyo Gauge Block Set and Tesa Tronic Amplifier (Cal.Lab-L11, Cal.Lab-L13 & Cal.Lab-L12)
Frequency Generation			
Frequency	10 Hz to 100 Hz 1 KHz to 100 KHz 1 MHz to 50 MHz	0.010 Hz to 0.020 Hz 0.00030 KHz 0.0000030 MHz to 0.00010 MHz	Cal.Lab-f6 Universal Frequency Counter, Cal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope
Frequency Measurement			

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Frequency	10 Hz to 100 Hz 1 KHz to 100 KHz 1 MHz to 50 MHz	0.040 Hz to 0.10 Hz 0.0010 KHz to 0.10 KHz 0.0010 MHz to 0.010 MHz	Cal.Lab-f6 Universal Frequency Counter, Cal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope
RPM Measurement			
Tachometers	30 RPM to 30000 RPM	0.50 RPM to 50 RPM	Cal.Lab-f1 Function Generator, Cal.Lab-f6 Universal Frequency Counter, Cal.Lab-f7 & f8 Digital Tachometers
Time Interval Measurement			
Stop Watch	10 s to 7200 s	± 0.52 s	Cal.Lab-f1 Function Generator, Cal.Lab-f2 Frequency Counter, Cal.Lab-t1 & t2 Stop Watches,
Timer	10 s to 7200 s	± 1 s	Cal.Lab-f1 Function Generator, Cal.Lab-f2 Frequency Counter, Cal.Lab-t1 & t2 Stop Watches,
Electrical Parameters (Generation & Source) – Calibrator			
AC Voltage @ 50 Hz	100 mV to 100 mV 1 V to 100 V 100 V to 1000 V	0.0090 mV to 0.0020 V 0.00020 V to 0.0010 V 0.0010 V to 0.10 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter
DC Voltage	1mV to 100 mV 1 V to 100 V 100 V to 1000 V	0.0020 mV to 0.0030 mV 0.0020 V to 0.0010 V 0.0010 V to	Cal.Lab-E67 Fluke 8508A Reference Multimeter

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		0.100 V	
AC Current @ 50 Hz	0 mA to 100 mA 1 A to 10 A	0.001 mA to 0.0040 A 0.0040 to 0.010 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter
DC Current	1 mA to 100 mA 1 A to 10 A	0.001 mA to 0.010 A 0.00040 to 0.0040 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter
Electrical Parameters (Measurement) – Multimeter			
AC Voltage @ 50 Hz	10 V to 100 V 100 V to 1000 V	0.0010 V to 0.010 V 0.010 V to 0.10 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator
DC Voltage	1mV to 100 mV 1 V to 100 V 100 V to 1000 V	0.0020 mV to 0.010 mV 0.0040 V to 0.0020 V 0.0020 V to 0.10 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator
AC Current @ 50 Hz	1 mA to 100 mA 1 A to 10 A	0.0020 mA to 0.032 A 0.0010 to 0.010 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator Cal.Lab-E13 & E 16 Clamp Meter
AC Current (Clamp on) @ 50 Hz	5 A to 800 A	0.50 A to 2.0 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator Cal.Lab-E13 & E 16 Clamp Meter
DC Current	2 mA to 100 mA 1 A to 10 A	0.001 mA to 0.0030 A 0.0010 to 0.010 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator Cal.Lab-E13 & E 16 Clamp Meter

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DC Current (Clamp on)	5 A to 800 A	0.50 A to 2.0 A	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65 Inmol Calibrator Cal.Lab-E13 & E 16 Clamp Meter
Resistance			
Resistance	1 Ω - 100 Ω 1 KΩ - 100 KΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	0.0010 Ω to 0.0020 GΩ 0.00020 kΩ to 0.10 kΩ 0.0010 MΩ to 0.010 MΩ 0.10 MΩ to 0.50 MΩ	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E55 Milli Ohm Meter Cal.Lab-E69 Insulation Tester Cal.Lab-E11 & E 21 Standard Resistances
Power (Single Phase)			
AC Power @ 50 Hz	10 W to 5000 W	0.040 W to 3.0 W	U.ID#(LLC/APCIC/PCP/01) Technique: Direct comparison Stabilized Power Source, Power Meter, Digital Multimeter
Spectrophotometer			
Spectrophotometer	Wavelength Accuracy 525.5 nm 37.5%T Transmittance @ 590nm 10.2%T 10.4 %T Absorbance @ 590nm 0.990 Abs 0.997 Abs	1 nm 0.01 to 0.03 %T 0.01to 0.040 Abs	U.ID#(LLC/APCIC/SCP/01) SS-1 Spectronic Standard Filters Thermo Spectronics USA

* **Expanded Uncertainty:**

- Expanded Uncertainty is the measurement uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. This measurement uncertainty is a value for which the laboratory has been accredited using the procedure that was the subject of assessment. In certificates issued under its accreditation scope an accredited laboratory is not permitted to quote an uncertainty that is smaller than the published uncertainty for respective ranges as given above.

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