Accreditation No: LAB 036

Awarded to

Applied Physics Computers & Instrumentation Centre (APCIC), Pakistan Council of Scientific & Industrial Research (PCSIR) Labs. 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 **16-06-2025.**

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

14-03-2024
Date

SD
Director General

Calibration Laboratory.

Accreditation scope of Applied Physics Computers & Instrumentation Centre (APCIC), Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories Complex, Lahore 54600, Pakistan**.**

Permanent laboratory premises [X]

Field of Measurement: Volume Measurement			
Measured Quantity	**Range**	***Expanded Uncertainty (±)**	**Technique, Reference Standard, Equipment**
Glassware	1 mL	1.0 µL	**Reference Used:** F2 Class Mass Weighing Scale **UUC:** Pipettes, Burettes, Dispensers, Cylinders, Flasks, Beakers, Jugs etc. **Method Used:** ASTM E-542 LLC/APCIC/VCP/01 LLC/APCIC/VCP/02
	2 mL	1.6 µL	
	5 mL	5.0 µL	
	10 ml	8.0 µL	
	25 mL	2.0 µL	
	25.1 mL to 100.0 mL	7.8 µL	
	100.1 mL to 500.0 mL	1.1 mL	
	500.0 to 1000.0 mL	6.0 mL	
	1.0 L to 5.0 L	5.0 mL	
Micropipette	20 µL to 1000 µL	0.25 µL	
Field of Measurement: Masses and Weighing Balances			
Weighing Scales	1.0 mg to 220.0000 g 0.1 g to 20.0000 kg 0.10 kg to 260.0 kg	0.10 mg 0.10 g 0.10 kg	**Reference Used:** E2 Class Mass F2 Class Mass **UUC:** Class I & Below F1 Class & Below **Method Used:** OIML , R111-1 R111-2, NIMT CP-301 LLC/APCIC/MCP/01 LLC/APCIC/MCP/02
Masses	1.0 mg to 500.0 mg 1.0000 g to 200.0000 g 0.5000 kg to 20.0000 kg 30.000 kg to 50.000 kg	0.050 mg 0.060 mg 0.080 g 4.6 g	
Field of Measurement: Temperature Measurement			
Temperature	- 50.00 °C to 50.00 °C 50.10 °C to 400.0 °C 400.1 °C to 800.0 °C	0.050 °C 0.20 °C 0.30 °C	**Reference Used:** Reference Thermometer with RTD Probe , Precision k-type Thermocouple , Temperature Controller, Dry Well Calibrator **UUC:** Digital Thermometer Liquid in glass Thermometer

14-03-2024
Date

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Temperature	-50.0 °C to 100.0 °C 100.1 °C to 350 °C	0.20 °C 0.28 °C	Method Used: LLC/APCIC/TCP/01 LLC/APCIC/TCP/02
Field of Measurement: Temperature Source			
Temperature	- 50.0 °C to 100.0 °C 100.1 °C to 350.0 °C 350.1 °C to 600 °C	0.18 °C 0.20 °C 0.24 °C	**Reference Used:** Reference Thermometer with RTD Probe Precision Thermometer with k-type **UUC:** Thermocouple, Temperature Controllers Dry Block Calibrator / Temperature Calibrator Environmental Chambers / Oven Muffle Furnace **Method Used:** LLC/APCIC/TCP/01
Temperature	- 40.0 °C to 100.0 °C 100.1 °C to 300.0 °C	0.18 °C 0.22 °C	
Temperature	200 °C to 1000 °C	0.65 °C	
Temperature Measurement by Simulation Method			
Temperature	- 100 °C to 800 °C	0.20 °C	**Reference Used:** Portable Calibrator, Fluke 8508A Reference Multimeter **UUC:** RTD Pt 100, Thermocouple Type k and J **Method Used:** LLC/APCIC/TCP/01
Temperature	- 200 °C to 1200 °C	0.24 °C	
Temperature	- 200 °C to 1200 °C	0.24 °C	
Field of Measurement: Temperature & Humidity Measurement			
Source	10.0 °C to 40.0 °C 30 %RH to 80 %RH	0.45 °C 2.9 %RH	**Reference Used:** Thermo-hygrometer **UUC:** Humidity Chamber, **Method used:** LLC/APCIC/TCP/03
Measurement	10 °C to 40 °C 30 %RH to 80 %RH	0.45 °C 2.9 %RH	
Field of Measurement: Pressure Measurement			
Pressure	0.01 to 10.00 psi 10.01 to 50.00 psi 50.01 to 100.00 psi 100.01 to 250.00 psi	0.31 psi 0.36 psi 0.37 psi 0.38 psi	**Reference Used:** Pressure Calibrator Dead Weight Tester & Pressure Guages **UUC:** Pressure Gauge
	50 psi to 500 psi 550 psi to 1000 psi	1.4 psi 1.9 psi	

14-03-2024
Date

Sd
Director

Pressure	2000 psi to 5000 psi 5000 psi to 8000 psi	5.7 psi 8.8 psi	(Pneumatic , Vacuum & Hydraulic) Pressure calibrator , Dead weight tester **Method Used:** DKD-R 6-1 LLC/APCIC/PCP/01 LLC/APCIC/PCP/02
	100 mm of Hg to 200 mm of Hg 220 mm of Hg to 500 mm of Hg 520 mm of Hg to 600 mm of Hg	12 mm of Hg 12 mm of Hg 12 mm of Hg	
Field of Measurement: Dimensional Measure			
General Dimension measurements Length, Diameter, Thickness and Depth of Industrial Artifacts	0.001 mm to 25.000 mm	0.40 µm	**Reference Used:** Gauge Block Set, Micrometer, Vernier Caliper, Line Length Standard, Measuring Tape **Method Used:** EAL-G 21 SOP # 10 & 12 (NIST) LLC/APCIC/DCP/01 LLC/APCIC/DCP/02 LLC/APCIC/DCP/03 LLC/APCIC/DCP/04 LLC/APCIC/DCP/05
	25.10 mm to 100.00 mm	1.0 µm	
	100.01 mm to 300.00 mm	1.0 µm	
	1.0 cm to 100.0 cm	0.10 cm	
	100.1 cm to 500.0 cm	0.10 cm	
Field of Measurement: Frequency			
Frequency **Generation**	10.0 Hz to 100.0 Hz	0.010 Hz	**Reference Used :** Universal Frequency Counter **UUC:** Function Generator Frequency Counter, Digital Oscilloscope **Method Used:** LLC/APCIC/FCP/01
	1.000 kHz to 100.00 kHz	0.039 Hz	
	1.00 MHz to 100.0 MHz	0.060 kHz	
Frequency **Measurement**	10.0 Hz to 100.0 Hz	0.010 Hz	
	1.000 KHz to 100.00 KHz	0.080 Hz	
	1.00 MHz to 100.00 MHz	0.060 kHz	
Field of Measurement: RPM Measurement			
Tachometers / RPM Measurement	30.0 RPM to 300.0 RPM 300.1 RPM to 6000.0 RPM 6000.1 RPM to 15000.0 RPM 15000.1 RPM to 30000.0 RPM	0.50 RPM 0.72 RPM 1.0 RPM 2.5 RPM	**Reference Used:** Universal Frequency Counter **UUC:** Function Generator, Digital Tachometers **Method Used:** LLC/APCIC/RCP/01

14-03-2024
Date

Sd
Director

Field of Measurement: Time Interval Measurement			
Stop Watch	10 s to 3600 s 3601 s to 7200 s	0.49 s 0.75 s	**Reference Used:** Universal Frequency Counter **UUC:** Function Generator, Frequency Counter, Stop Watches, **Method Used:** LLC/APCIC/WCP/01
Timer	10 s to 7200 s	0.75 s	
Field of Measurement: Electrical Parameters			
DC Voltage	1.00 mV to 100.00 mV 1.000 V to 10.000 V 10.001 V to 100.00 V 100.01 V to 1000.0 V	0.61 µV 0.011 mV 0.11 mV 56 mV	**Reference Used:** Reference Multimeter Fluke 8508A **UUC:** Inmel Calibrator Clamp Meter Standard Resistors **Method Used:** LLC/APCIC/ECP/01 LLC/APCIC/ECP/02
AC Voltage @ 50 Hz	100.0 mV to 1.000 V 1.001 V to 10.000 V 10.001 V to 100.00 V 100.01 V to 500.0 V 500.1 V to 1000 V	0.46 mV 0.11 mV 2.6 mV 11 mV 51 mV	
AC Current @ 50 Hz	1.00 mA to 10.00 mA 10.01 mA to 100.0 mA 1.000 A to 10.000 A	0.76 µA 3.6 µA 4.8 mA	
AC Current (Clamp on) @ 50 Hz	5.0 A to 10.0 A 10.1 A to 100.0 A 100.1 A to 500.0 A 500.1 A to 800 A	0.20 A 0.52 A 1.1 A 2.0% A	
DC Current	1.00 mA to 10.00 mA 10.01 mA to 100.0 mA 1.000 A to 10.000 A	2.2 µA 5.6 µA 4.4 mA	
DC Current (Clamp on)	5.0 A to 10.0 A 10.1 A to 100.0 A 100.1 A to 500.0 A 500.1 A to 800 A	0.30 A 0.33 A 1.3 A 2.0% A	
Resistance	1.00 Ω to 10.00 Ω	0.013 Ω	
	10.01 Ω to 100.00 Ω	0.015 Ω	
	100.00 Ω to 1.000 kΩ	0.015 Ω	
	1.001 kΩ to 10.00 kΩ	0.10 Ω	
	10.01 kΩ to 100.00 KΩ	4.7 Ω	
	100.01 kΩ to 1.000 MΩ	0.54 KΩ	
	1.001 MΩ to 10.00 MΩ	8.7 kΩ	
	10.01 MΩ to 100.0 MΩ	15 kΩ	
Insulation Resistance	100.1 MΩ to 1.000 GΩ		

14-03-2024
Date

Sd
Director

@ 250 V to 1000 V		5.0 MΩ	
Low Resistance Measurement	10.0 mΩ to 100.0 mΩ	0.14 mΩ	
Field of Measurement: AC Power (Single Phase)			
AC Power @ 50 Hz	10.00 W to 100.0 W 100.1 W to 500.0 W 500.1 W to 1000.0 W 1000.1 W to 5000.0 W	0.12 W 0.24 W 0.42 W 1.0 W	**Reference Used:** Multimeter Fluke 8508A **UUC:** Power Meter Clamp Meter Inmel 33 Calibrator **Method Used:** LLC/APCIC/ECP/01 LLC/APCIC/ECP/02
Field of Measurement: Spectrophotometer			
Wavelength Accuracy Transmittance @ 590nm & 412 nm Absorbance @ 590nm & 412 nm	525.5 nm 6.13%T to 10.4 %T 0.990 A to 1.209 A	0.78 nm 0.011 %T 0.043 A	**Reference Used:** SS-1 Spectronics Standard Filters Thermo Spectronics USA **UUC:** Spectrophotometers **Method Used:** Thermo Scientific, USA LLC/APCIC/SCP/01
Field of Measurement: pH **Measurement**			
pH Meter	4.00 pH to 10.00 pH @ 25 °C	0.010 pH	**Reference Used:** HANNA pH Buffers, pH Meter **UUC:** pH Meters **Method Used:** ASTM D 1293-12 LLC/APCIC/SCP/02

* **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.

14-03-2024
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