

	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 & 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 **16-06-2022**.

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

11-03-2021
Date

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Director General

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

Field of Measurement:			
Measured Quantity	Range	Calibration Measurement Capability * (\pm)	Brief Description of measurement and equipment used
Volume Measures (ASTM E-542)			
Pipettes Burettes	0.01 mL to 100 mL	0.0010 mL to 0.50 mL	Cal.Lab-M25 Class F2 Weighing Scale
Measuring Cylinders	1 mL to 2 L	0.010 mL to 10 mL	Cal.Lab-M24 Class E2 Weighing Scale
Measuring Beakers/ Flasks/jugs	10 L to 2 L 1 L to 5 L	0.10 mL to 5.0 mL 5.0 mL to 50 mL	Cal.Lab-M24 Class E2 Weighing Scale
Micro Pipettes	10 μ L to 1000 μ L	0.60 μ L to 10 μ L	Cal.Lab-M25 Class F2 Weighing Scale
Masses and Weighing Balances			
Weighing Scales	1 mg to 300 g	0.10 mg	E2 Class Mass(Cal-Lab-24)
Weighing Scales Class I and Below Accuracy Classes	500 g to 20 kg	0.10 g	F2 Class Mass(Cal-Lab-26)
Masses	1 mg to 200 g	0.10 mg	E2 Class Mass(Cal-Lab-24)
NIMT CP-301 F1 Class & Below	500 g to 20 kg	0.10 g	F2 Class Mass(Cal-Lab-26) & Cal-Lab-32
Temperature Measurement			
Digital Thermometer EURAMET cg-13 & 8	-50 $^{\circ}$ C to 350 $^{\circ}$ C 350 $^{\circ}$ C to 600 $^{\circ}$ C 600 $^{\circ}$ C to 800 $^{\circ}$ C	0.20 $^{\circ}$ C 0.30 $^{\circ}$ C 1.0 $^{\circ}$ C	Reference Thermometer with RTD Probe (CAL. Lab-T17), Precision Thermometer with k-type Thermocouple (Cal. Lab-

13-03-2021

Date

Sd

Director

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

			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)
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 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 to 1.0 °C	
Pressure Measurement			
Pressure Gauge Pneumatic	2 psi to 250 psi	0.30 psi	Pressure Calibrator (Cal.Lab-P30)
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)

13-03-2021
Date

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

Field of Measurement:			
Measured Quantity	Range	Calibration Measurement Capability * (+)	Brief Description of measurement and equipment used
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			
Frequency Generation	10 Hz to 100 Hz	0.010 Hz to 0.020 Hz	Cal.Lab-f6: Universal Frequency Counter, Cal.Lab-f2: Frequency Counter, Cal.Lab-f3: Digital Oscilloscope
	1 kHz to 100 kHz	0.00030 kHz	
	1 MHz to 50 MHz	0.0030 kHz to 0.00010 MHz	
Frequency Measurement	10 Hz to 100 Hz	0.040 Hz to 0.10 Hz	Cal.Lab-f1: Function Generator Cal.Lab-f6: Universal Frequency Counter, Cal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope
	1 KHz to 100 KHz	0.0010 KHz to 0.10 KHz	
	1 MHz to 50 MHz	0.0010 MHz to 0.010 MHz	
RPM Measurement			

13-03-2021
Date

Sd
Director

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

Tachometers / RPM Measurement	30 RPM to 30000 RPM	0.50 RPM to 5.0 RPM	Cal.Lab-f1: Function Generator, Cal.Lab-f6: Universal Frequency Counter, Cal.Lab-f7 & f8: Digital Tachometers
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Field of Measurement:

Measured Quantity	Range	Calibration Measurement Capability * (\pm)	Brief Description of measurement and equipment used
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Time Interval Measurement

Stop Watch	10 s to 7200 s	\pm 0.52 s	Cal.Lab-f1 Function Generator,
Timer	10 s to 7200 s	\pm 1.0 s	Cal.Lab-f2 Frequency Counter, Cal.Lab-t1 & t2 Stop Watches,

Electrical Parameters (Generation & Source) e.g : Calibrator

AC Voltage @ 50 Hz	100 mV to 100 V 1 V to 100 V 100 V to 1000 V	0.010 mV to 0.0020 V 0.00020 V to 0.0010 V 0.0010 V to 0.10 V	Cal.Lab-E67: Reference Multimeter Fluke 8508A
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 0.100 V	
AC Current @ 50 Hz	1mA to 100 mA 1 A to 10 A	0.0010 mA to 0.0040 A 0.0040 to 0.010 A	
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	
Resistance	1 Ω - 100 Ω	0.020 Ω	

13-03-2021

Date

Sd

Director

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

	1 k Ω - 100 k Ω 1 M Ω	to 0.04 Ω 0.030 k Ω to 0.20 k Ω 0.0020 M Ω	
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Field of Measurement:

Measured Quantity	Range	Calibration Measurement Capability * (\pm)	Brief Description of measurement and equipment used
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 Reference Multimeter
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	Fluke 8508A Cal.Lab-E65
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	Inmel Calibrator
DC Current	1mA to 100 mA 1 A to 10 A	0.001 mA to 0.0030 A 0.0010 to 0.010 A	
AC Current (Clamp on) @ 50 Hz	5 A to 800 A	0.50 A to 2.0 A	Cal.Lab-E67 Reference Multimeter Fluke 8508A
DC Current (Clamp on)	5 A to 800 A	0.50 A to 2.0 A	Cal.Lab-E13 & E 60 Clamp Meter
Resistance			
Resistance	1 Ω - 100 Ω	0.0010 Ω to	Cal.Lab-E67

13-03-2021

Date

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

Insulation Resistance @ 250V to 1000 V Low Resistance Measurement	1 kΩ - 100 kΩ 1 MΩ to 10 MΩ 10 MΩ to 1 GΩ 10 mΩ to 100 mΩ	0.0020 Ω 0.00020 kΩ to 0.10 kΩ 0.0010 MΩ to 0.010 MΩ 0.58 MΩ to 0.01 GΩ 0.10 mΩ to 0.2 mΩ	Fluke 8508A Reference Multimeter Cal.Lab-E55 Milli Ohm Meter Cal.Lab-E69 Insulation Tester Cal.Lab-E58 LCR Meter Standard Resistors
Field of Measurement:			
Measured Quantity	Range	Calibration Measurement Capability * (±)	Brief Description of measurement and equipment used
AC Power (Single Phase)			
AC Power @ 50 Hz	10 W to 5000 W	0.040 W to 3.0 W	Cal.Lab-E67 Reference Multimeter Fluke 8508A Cal.Lab-E13 Power Meter Cal.Lab: E 60 Clamp Meter Inmel 33 Calibrator
Spectrophotometer			
Spectrophotometer Wavelength Accuracy Transmittance @ 590nm Absorbance @ 590nm	525.5 nm 37.5%T 10.2%T 10.4 %T 0.990 Abs 0.997 Abs	1.0 nm 0.010 to 0.030 %T 0.010 to 0.040 Abs	SS-1 Spectronic Standard Filters Thermo Spectronics USA
Temperature & Humidity Measurement			
Source	10 °C to 40 °C	0.40 °C to 0.80	Thermo-hygrometer

13-03-2021
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Sd
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	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 036
---	-----------------------------------	---

	30 %RH to 80 %RH	°C 1.10 %RH to 1.20 %RH	Cal-Lab-TH8, Th18, TH20, TH22
Measurement	10 °C to 40 °C 30 %RH to 80 %RH	0.40 °C to 0.80 °C 1.10 %RH to 1.20 %RH	Humidity Chamber, Cal-Lab- THC1 Thermo-hygrometer Cal-Lab- TH8, Th18, TH20, TH22
pH Measurement			
pH Meter	4.00 pH to 10.00 pH Temperature @ 25 °C	0.010 pH 0.10 °C	pH Buffers HANNA Digital Thermometer Cal.Lab-DT02

*** 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.

13-03-2021
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