

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

<u>14-09-2020</u> Date

Director General



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 X

Measured quantity	Range	*Expanded Uncertainty (±)	Technique, Reference Standard, Equipment
Volume Measures (A	STM 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 Weighir	ng Balances		
Weighing Scales	Up to 200 g	0.00010 g	E2 Class Mass(Cal-Lab-24)
Weighing Scales Class I and Below Accuracy Classes	Up to 500 g	0.0010 g	E2 Class Mass(Cal-Lab-24)
recuracy classes	Up to 20 kg	0.00010 kg	F2 Class Mass(Cal-Lab-26)
Masses	1 mg to 200 mg	0.060 mg	E2 Class Mass(Cal-Lab-24)
NIMT CP-301 F1 Class & Below	500 g to 20 kg	0.00010 kg	F2 Class Mass(Cal-Lab-26) &Cal-Lab-32
Temperature Measu	irement		·
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-

<u>14-09-2020</u>



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

	1		
			T34 & T2), Temperature
			Controllers (Cal. Lab-TC1, TC2
			& TC3), Dry Well Calibrator
			(Cal. Lab-T16)
			Reference Thermometer with
Liquid in glass	-50 °C to 100 °C	0.20 °C	RTD Probe (CAL. Lab-T17),
Thermometer	100 °C to 350 °C	1.0 °C	Precision Thermometer with k-
EA-10/11 & 13	100 0 10 550 0	1.0 C	type Thermocouple (Cal. Lab-
Lit 10/11 & 15			T34 & T2), Dry Well Calibrator
			(Cal. Lab-T16)
			Reference Thermometer with
			RTD Probe (CAL. Lab-T17),
	-50 °C to 350 °C	0.20 °C	Precision Thermometer with k-
Digital Thermometer	350 °C to 600 °C	0.20 °C	type Thermocouple (Cal. Lab-
EURAMET cg-13 & 8		0.50 °C 1.0 °C	T34 & T2), Temperature
C	600 °C to 800 °C	1.0 °C	Controllers (Cal. Lab-TC1, TC2
			& TC3), Dry Well Calibrator
			(Cal. Lab-T16)
Temperature Source			• • • • • • • • • • • • • • • • • • • •
.			Reference Thermometer with
Dry Block Calibrator /	-50 °C to 100 °C	0.20 °C	RTD Probe (CAL. Lab-T17),
Temperature	100 °C to 600 °C	0.80 °C	Precision Thermometer with k-
Calibrator			type Thermocouple (Cal. Lab-
EURAMET cg-13 & 8			T34 & T2),
			Reference Thermometer with
			RTD Probe (CAL. Lab-T17),
	10.00 - 100.00	0.00.00	Precision Thermometer with k-
Environmental	-40 °C to 100 °C	0.20 °C	type Thermocouple (Cal. Lab-
Cahmbers	100 °C to 300 °C	0.80 °C	T34 & T2), Temperature
EA-10/08			Controllers (Cal. Lab-TC1, TC2
			& TC3)
			,
	200 °C to 1000	1.0.90	Precision Thermometer with k-
Muffle Furnace	°C	1.0 °C	type Thermocouple (Cal. Lab-
EA-10/08			T34 & T2
Temperature Measu		tion Method (EURAME)	Γ cg-11)
RTD Pt 100	-100 °C to 800 °C	0.20 °C	Fluke 8508A Reference
KIDIT 100			Multimeter (Cal. Lab- E67)
Thermocouple Type	-200 °C to 1200	0.20 °C to 1.0 °C	
"k"	°C	0.20 C to 1.0 C	Portable Calibrator (Cal. Lab-
Λ			E2), Fluke 8508A Reference
Thermocounts Tures	-200 °C to 1200	0.20 °C to 1.0 °C	Multimeter (Cal. Lab- E67)
Thermocouple Type "J"	°C	0.20 C 10 1.0 C	Multimeter (Cal. Lab- E07)
•			
Pressure Prossure Cougo	2 noi to 250 mai	0.20	Draggura Calibrator (Cal Lab
Pressure Gauge	2 psi to 250 psi	0.30 psi	Pressure Calibrator (Cal.Lab-
Pneumatic			P30)
<u>14-09-2</u>			
Date	e		Director
		D	



Pressure Gauge Hydraulic500 psi to 8000 psi12 psiDead Weight Tester (CalLab-P17& Pressure Gauge (Cal.Lab-P27)Vacuum Gauge20 mm of Hg to 700 mm of Hg12 mm of HgVacuum Gauge (Cal.Lab-P27)Dimensional Measure20 mm of Hg to 700 mm of Hg12 mm of HgVacuum Gauge (Cal.Lab-P27)Dimensional Measure1 cm to 100 cm0.10 cmLine Length Standard (CalLab-L2)Measuring Tape5 cm to 500 cm0.10 cmMeasuring Tape (Cal.Lab-L5)Vernier Caliper0.5 mm to 300 mm0.010 mmMitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab- L13)Outside Micrometer0.5 mm to 25 mm0.00010 mmMitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab- L13)Gauge Blocks0.5 mm to 100 mm0.40 µmMitutoyo Gauge Block Set and Tesa Tronic Amplifier (Cal.Lab-L11, Cal.Lab-L13) & Cal.Lab-L12)Frequency Generation10 Hz to 100 Hz0.010 Hz to 0.020 HzCal.Lab-f6 Universal Frequency Counter, Cal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital OscilloscopeFrequency Measurement1 MHz to 50 MHz0.0000030 MHz to 0.00010Cal.Lab-f3 Digital Oscilloscope				
Hydraulicpsi(Cal.Lab-P17& Pressure Gauge (Cal.Lab-P27)Vacuum Gauge20 mm of Hg to 700 mm of Hg12 mm of HgVacuum Gauge (Cal.Lab-P3)Dimensional Measure1 cm to 100 cm0.10 cmLine Length Standard (Cal.Lab-L2)Measuring Tape5 cm to 500 cm0.10 cmMeasuring Tape (Cal.Lab-L2)Wernier Caliper0.5 mm to 300 mm0.010 mmMitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab- L13)Outside Micrometer0.5 mm to 25 mm0.0010 mmMitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab- L13)Gauge Blocks0.5 mm to 100 mm0.40 μmMitutoyo Gauge Block Set (Cal.Lab-L11 & Cal.Lab- L13)Gauge Blocks0.5 mm to 100 mm0.40 μmMitutoyo Gauge Block Set (Cal.Lab-L11, Cal.Lab- L13)Frequency Generation10 Hz to 100 Hz0.010 Hz to 0.020 HzCal.Lab-f6 Universal Frequency Counter, Cal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope1 MHz to 50 MHz0.0000030 MHz to 0.00010Cal.Lab-f3 Digital Oscilloscope				
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Image: height of the second	Measuring Tape	5 cm to 500 cm	0.10 cm	Measuring Tape (Cal.Lab-L5)
Image: height of the second				
Image: constraint of the second se	Vernier Caliper	0.5 mm to 300	0.010 mm	Mitutoyo Gauge Block Set
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Frequency Generation& Cal.Lab-L12)Frequency Generation10 Hz to 100 Hz0.010 Hz to 0.020 HzCal.Lab-f6 Universal Frequency Counter,I KHz to 100 KHz0.00030 KHz 0.000030 KHzCal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital OscilloscopeI MHz to 50 MHz0.0000030 MHz to 0.00010 MHzCal.Lab-f3 Digital Oscilloscope		mm		-
Frequency GenerationFrequency10 Hz to 100 Hz0.010 Hz to 0.020 HzCal.Lab-f6 Universal Frequency Counter,I KHz to 100 KHz0.00030 KHzCal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope1 MHz to 50 MHz0.0000030 MHz to 0.00010 MHzCal.Lab-f3 Digital Oscilloscope				(Cal.Lab-L11, Cal.Lab-L13
Frequency10 Hz to 100 Hz0.010 Hz to 0.020 HzCal.Lab-f6 Universal Frequency Counter,1 KHz to 100 KHz0.00030 KHzCal.Lab-f2 Frequency Counter, Cal.Lab-f3 Digital Oscilloscope1 MHz to 50 MHz0.0000030 MHz to 0.00010Cal.Lab-f3 Digital Oscilloscope				& Cal.Lab-L12)
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1 MHz to 50 0.0000030 MHz to 0.00010 MHz MHz				Cal.Lab-f3 Digital Oscilloscope
		1 MHz to 50	0.0000030 MHz to 0.00010	
Frequency Measurement		MHz	MHz	
Frequency Measurement				
	Frequency Measuren	nent		



Frequency	10 Hz to 100 Hz	0.040 Hz to 0.10 Hz	Cal.Lab-f6 Universal Frequency Counter,		
	1 KHz to 100 KHz	0.0010 KHz to 0.10 KHz	Cal.Lab-f2 Frequency Counter,		
			Cal.Lab-f3 Digital Oscilloscope		
	1 MHz to 50 MHz	0.0010 MHz to 0.010 MHz			
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 Measure	ement				
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	<u>+</u> 1 s	Cal.Lab-f1 Function Generator, Cal.Lab-f2 Frequency Counter, Cal.Lab-t1 & t2 Stop Watches,		
Electrical Parameters	Electrical Parameters (Generation & Source) – Calibrator				
	100 mV to 100	0.0090 mV to			
AC Voltage @ 50 Hz	mV 1 V to 100 V	0.0020 V 0.00020 V to 0.0010 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter		
	100 V to 1000 V	0.0010 V 0.0010 V to 0.10 V	Reference Multimeter		
	1mV to 100 mV	0.0020 mV to			
DC Voltage	1 V to 100 V	0.0030 mV 0.0020 V to 0.0010 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter		
	100 V to 1000 V	0.0010 V to			

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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) – N	Iultimeter	·
AC Voltage	10 V to 100 V	0.0010 V to 0.010 V	Cal.Lab-E67 Fluke 8508A
@ 50 Hz	100 V to 1000 V	0.010 V to 0.10 V	Reference Multimeter Cal.Lab-E65 Inmol Calibrator
DC Voltage	1mV to 100 mV 1 V to 100 V	0.0020 mV to 0.010 mV 0.0040 V to 0.0020 V	Cal.Lab-E67 Fluke 8508A Reference Multimeter Cal.Lab-E65
	100 V to 1000 V	0.0020 V to 0.10 V	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) Resistance	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	1.0.100.0		C-11-1-E(7
	1 Ω - 100 Ω	0.0010 Ω to 0.0020 G Ω	Cal.Lab-E67
Resistance	1 KΩ - 100 KΩ 1 MΩ to 10 MΩ	0.00020 kΩ to 0.10 kΩ 0.0010 MΩ to 0.010 MΩ 0.10 MΩ to 0.50 MΩ	Fluke 8508A Reference Multimeter Cal.Lab-E55 Milli Ohm Meter Cal.Lab-E69 Insulation Tester Cal.Lab-E11 & E 21
			Standard Resistances
	$10 \text{ M}\Omega$ to 100 M	Ω	
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	1 nm	U.ID#(LLC/APCIC/SCP/01) SS-1 Spectronic Standard Filters
Transmittance @ 590nm	10.2%T 10.4 %T	0.01 to 0.03 %T	Thermo Spectronics USA
Absorbance @ 590nm	0.990 Abs 0.997 Abs	0.01to 0.040 Abs	

* 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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