

F-06/02

Issue Date: 18/08/2020

Rev. No: 09 LAB 036

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	SD_
Date	Director General



F-06/02

Issue Date: 18/08/2020

Rev. No: 09 LAB 036

### **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

Classware	Field of Measuren	nent: Volume Measurement		
1 mL   1.0 μL   2 mL   5.0 μL   5 mL   5.0 μL   1.6 μL   1.6 μL   5 mL   1.6 μL   1.6 μL   1.6 μL   5.0 μL   10 ml   2.5 mL   2.0 μL   100.1 mL to 500.0 mL   1.1 mL   500.0 to 1000.0 mL   1.0 L to 5.0 L   1.0 L to 7.0 L to 7.0 mL   1.0 L to 7.0 to 800.0 kg   0.10 kg   0.060 mg   0.5000 kg   0.060 mg   0.060 mg   0.5000 kg   0.080 g	Measured Quantity	Range	Uncertainty	Reference Standard,
2 mL   1.6 μL   5 mL   2.0 μL   25 mL   2.0 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   1.0 L to 5.0 L   5.0 mL   ASTM E-542   LLC/APCIC/VCP/01   LLC/APCIC/VCP/02   LLC/APCIC/VCP/02   LCAPCIC/VCP/02   LCAPCIC/MCP/02   LCAPCIC/MCP/	Glassware	1 mL	` `	
5 mL   10 ml   8.0 μL   25 mL   2.0 μL   25 mL   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   ASTM E-542   LLC/APCIC/VCP/02			'	
10 ml			•	Weighing Scale
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   1.0 L to 5.0 L   1.0 L to 5.0 L   20 μL to 1000 μL   0.25 μL   LLC/APCIC/VCP/01 LLC/APCIC/VCP/02			•	
Dispensers, Cylinders, Flasks, Beakers, Jugs etc.   S00.0 to 1000.0 mL   1.1 mL   500.0 to 1000.0 mL   1.0 L to 5.0 L   5.0 mL   ASTM E-542   LLC/APCIC/VCP/01 LLC/APCIC/VCP/02   LLC/APCIC/MCP/03   LLC/APCIC/MCP/04   LLC			<u> </u>	
100.1 mL to 500.0 mL   1.1 mL   500.0 to 1000.0 mL   1.0 mL   500.0 to 1000.0 mL   1.0 L to 5.0 L   5.0 mL   ASTM E-542   LLC/APCIC/VCP/01 LLC/APCIC/VCP/02   E2 Class Mass   F2 Class Mass   F3 Class Mass   F4 Class Mass				
S00.0 to 1000.0 mL				
1.0 L to 5.0 L   5.0 mL   ASTM E-542				
Micropipette   20 μL to 1000 μL   0.25 μL   LLC/APCIC/VCP/01   LLC/APCIC/VCP/02   Reference Used: E2 Class Mass   F2 Class Mass   UUC:   Class I & Below   F1 Class & Below   F1 Class & Below   Method Used:   OIML , R111-1   R111-2, NIMT CP-301   LLC/APCIC/MCP/01   LLC/APCIC/MCP/02   LLC/APCIC/MCP/01   LLC/APCIC/MCP/02   Reference Used:   Reference Used:   Reference Thermometer   With RTD Probe   Precision k-type   Thermocouple   Temperature Controller, Dry Well Calibrator   UUC:   Digital Thermometer   Liquid in glass   Thermometer   Thermometer   Class I & Below   Method Used:   OIML , R111-1   R111-2, NIMT CP-301   LLC/APCIC/MCP/02   Reference Used:   Reference Used:   Reference Thermometer   Thermocouple   T				
Time	Micropipette			
Name	1 1		•	
1.0 mg to 220.0000 g	Field of Measuren	nent: Masses and Weighing I	Balances	ELECTRI CICI V CI / 02
0.1 g to 20.0000 kg				Reference Used:
Masses	8 8		0.10 g	
1.0 mg to 500.0 mg		0.10 kg to 260.0 kg	0.10 kg	F2 Class Mass
1.0000 g to 200.0000 g				
1.0000 g to 200.0000 kg   0.000 ling   0.000 ling   0.000 ling   0.080 g   30.000 kg to 50.000 kg   4.6 g	Masses	1.0 mg to 500.0 mg	0.050 mg	
Temperature    30.000 kg to 50.000 kg   4.6 g   OIML , R111-1     R111-2, NIMT CP-301     LLC/APCIC/MCP/02     Temperature   -50.00 °C to 50.00 °C   0.050 °C     Temperature   -50.10 °C to 400.0 °C   0.20 °C     400.1 °C to 800.0 °C   0.30 °C     Temperature   -50.30 °C   0.30 °C     Temperature   -50.10 °C to 800.0 °C   0.30 °C     Temperature   -50.10 °C to 800.0 °C   0.30 °C     Temperature Controller, Dry Well Calibrator     UUC: Digital Thermometer     Liquid in glass   -50.00 °C     LLC/APCIC/MCP/02     CIML , R111-1     R111-2, NIMT CP-301     LLC/APCIC/MCP/02     CIMC   Reference Used: Reference Used: Reference Thermometer     CIMC   Company     CIMC		1.0000 g to 200.0000 g	0.060 mg	
Field of Measurement: Temperature Measurement  - 50.00 °C to 50.00 °C  Temperature  - 50.10 °C to 400.0 °C  400.1 °C to 800.0 °C  - 0.30 °C  -		0.5000 kg to 20.0000 kg	0.080 g	
Field of Measurement: Temperature Measurement  Temperature  - 50.00 °C to 50.00 °C  Temperature  - 50.10 °C to 400.0 °C  400.1 °C to 800.0 °C  - 0.30 °C		30.000 kg to 50.000 kg	4.6 g	*
Field of Measurement: Temperature Measurement  - 50.00 °C to 50.00 °C  Temperature  - 50.10 °C to 400.0 °C  400.1 °C to 800.0 °C  - 0.20 °C  - 0.30 °C  -				
Field of Measurement: Temperature Measurement  - 50.00 °C to 50.00 °C  Temperature  - 50.00 °C to 50.00 °C  Temperature  - 50.10 °C to 400.0 °C  - 400.1 °C to 800.0 °C  - 0.20 °C  - Precision k-type  Thermocouple,  Temperature Controller,  Dry Well Calibrator <u>UUC:</u> Digital Thermometer  Liquid in glass  Thermometer				
Temperature  - 50.00 °C to 50.00 °C  Temperature  - 50.00 °C to 50.00 °C  50.10 °C to 400.0 °C  400.1 °C to 800.0 °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	Field of Measurem	 nent: Temnerature Measurei	 nent	LLC/AI CIC/MCI/02
Temperature  50.10 °C to 400.0 °C  400.1 °C to 800.0 °C  0.20 °C  with RTD Probe, Precision k-type Thermocouple, Temperature Controller, Dry Well Calibrator UUC: Digital Thermometer Liquid in glass Thermometer	Tield of Wiedsdien			Reference Used:
50.10 °C to 400.0 °C  400.1 °C to 800.0 °C  0.20 °C  with RTD Probe, Precision k-type Thermocouple, Temperature Controller, Dry Well Calibrator <u>UUC:</u> Digital Thermometer Liquid in glass Thermometer	Temperature	20.00 2 10 20.00 2	0.050	
Precision k-type Thermocouple, Temperature Controller, Dry Well Calibrator <u>UUC:</u> Digital Thermometer Liquid in glass Thermometer	p	50.10 °C to 400.0 °C	0.20 °C	
400.1 °C to 800.0 °C  0.30 °C  Thermocouple, Temperature Controller, Dry Well Calibrator UUC: Digital Thermometer Liquid in glass Thermometer		30.10 C to 400.0 C	0.20 C	-
Temperature Controller, Dry Well Calibrator <u>UUC:</u> Digital Thermometer Liquid in glass Thermometer		400 1 90 4 900 0 90	0.20.90	
<u>UUC:</u> Digital Thermometer Liquid in glass Thermometer		400.1 °C to 800.0 °C	0.30 °C	Temperature Controller,
Digital Thermometer Liquid in glass Thermometer				
Liquid in glass Thermometer				
Thermometer				
14-03-2024 Sd				Thermometer

14-03-2024 Date Sd Director



F-06/02

Issue Date: 18/08/2020

Rev. No: 09 LAB 036

Temperature	-50.0 °C to 100.0 °C	0.20 °C	Method Used:
		0	LLC/APCIC/TCP/01
	100.1 °C to 350 °C	0.28 °C	LLC/APCIC/TCP/02
Field of Measure	ement: Temperature Source	,	
	- 50.0 °C to 100.0 °C	0.18 °C	Reference Used:
Temperature	100 1 00 . 250 0 00	0.20.00	Reference Thermometer
	100.1 °C to 350.0 °C	0.20 °C	with RTD Probe Precision Thermometer
	350.1 °C to 600 °C	0.24 °C	with k-type
	330.1 2 10 000 2	0.21	UUC:
	- 40.0 °C to 100.0 °C	0.18 °C	Thermocouple,
Temperature			Temperature Controllers
	100.1 °C to 300.0 °C	0.22 °C	Dry Block
			Calibrator / Temperature Calibrator
Temperature			Environmental
remperature	200 °C to 1000 °C	0.65 °C	Chambers / Oven
			Muffle Furnace
			Method Used:
77			LLC/APCIC/TCP/01
	easurement by Simulation M		D 0 V 1
Temperature	- 100 °C to 800 °C	0.20 °C	Reference Used: Portable Calibrator,
			Fluke 8508A Reference
Temperature	- 200 °C to 1200 °C	0.24 °C	Multimeter
_			<u>UUC:</u>
			RTD Pt 100,
			Thermocouple Type k
Temperature	- 200 °C to 1200 °C	0.24 °C	and J
Temperature	200 0 10 1200 0	0.21	Method Used: LLC/APCIC/TCP/01
Field of Measure	ment: Temperature & Hum	idity Measurem	· ·
Source	10.0 °C to 40.0 °C		Reference Used:
	30 %RH to 80 %RH	0.45 °C 2.9 %RH	Thermo-hygrometer
			<u>UUC:</u>
Measurement	10 °C to 40 °C	0.45 °C	Humidity Chamber,
	30 %RH to 80 %RH	2.9 %RH	Method used: LLC/APCIC/TCP/03
Field of Maggare	ement: Pressure Measureme		ELC/TH CIC/TCI/03
Field of Measure			Reference Used:
Pressure	0.01 to 10.00 psi 10.01 to 50.00 psi	0.31 psi 0.36 psi	Pressure Calibrator
11035010	50.01 to 100.00 psi	0.30 psi 0.37 psi	Dead Weight Tester &
	100.01 to 250.00 psi	0.37 psi 0.38 psi	Pressure Guages
			<u>UUC:</u>
	50 psi to 500 psi 550 psi to 1000 psi	1.4 psi 1.9 psi	Pressure Gauge
	220 har to 1000 har	1.9 psi	

14-03-2024 Date Sd Director



F-06/02

Issue Date: 18/08/2020

**Rev. No: 09 LAB 036** 

Duagana	2000: 40 5000:	5 7 ··· -:	(Proumatia Vasuum 0-
Pressure	2000 psi to 5000 psi	5.7 psi	(Pneumatic, Vacuum & Hydraulic) Pressure
	5000 psi to 8000 psi	8.8 psi	calibrator, Dead weight
1	100 mm of Hg to 200 mm of	12 mm of Hg	tester
	Hg	12 mm of Hg	Method Used:
	220 mm of Hg to 500 mm of	12 mm of Hg	DKD-R 6-1
	Hg		LLC/APCIC/PCP/01
	520 mm of Hg to 600 mm of		LLC/APCIC/PCP/02
	Hg		
Field of Measuremen	nt: Dimensional Measure		
General Dimension	0.001 mm to 25.000 mm	0.40 μm	Reference Used:
measurements		•	Gauge Block Set,
	25.10 mm to 100.00 mm	1.0 μm	Micrometer, Vernier
Length, Diameter,	25.10 mm to 100.00 mm	1.0 μπ	Caliper, Line Length
Thickness and	100.01 to 200.00	1.0	Standard, Measuring
Depth of Industrial	100.01 mm to 300.00 mm	1.0 μm	Tape
Artifacts			
Aimacis	1.0 cm to 100.0 cm	0.10 cm	<b>Method Used:</b>
			EAL-G 21
	100.1 cm to 500.0 cm	0.10 cm	SOP # 10 & 12
			(NIST)
			LLC/APCIC/DCP/01
			LLC/APCIC/DCP/02
			LLC/APCIC/DCP/03
			LLC/APCIC/DCP/04
	<u> </u>		LLC/APCIC/DCP/05
Field of Measuremen			T= 0 = -
Frequency	10.0 Hz to 100.0 Hz	0.010 Hz	Reference Used:
Generation	1 000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.020 11	Universal Frequency
	1.000 kHz to 100.00 kHz	0.039 Hz	Counter
	1.00 MHz to 100.0 MHz	0.060 kHz	<u>UUC:</u> Function Generator
Frequency	10.0 Hz to 100.0 Hz	0.010 Hz	
Measurement	1.000 KHz to 100.00 KHz	0.080 Hz	Frequency Counter, Digital Oscilloscope
	1.00 MHz to 100.00 MHz	0.060 kHz	Method Used:
			LLC/APCIC/FCP/01
			ELECTRI CIC/I CI/01
Field of Measuremen	nt: RPM Measurement	1	1
			Reference Used:
Tachometers / RPM	30.0 RPM to 300.0 RPM	0.50 RPM	Universal Frequency
Measurement	300.1 RPM to 6000.0 RPM	0.72 RPM	Counter
	6000.1 RPM to 15000.0	1.0 RPM	UUC:
	RPM	2.5 RPM	Function Generator,
	15000.1 RPM to 30000.0		Digital Tachometers
	RPM		Method Used:
			LLC/APCIC/RCP/01

14-03-2024 Date

Sd\_ Director



F-06/02

Issue Date: 18/08/2020

Rev. No: 09 LAB 036

Field of Measurement: Time Interval Measurement			
C. W 1	10 s to 3600 s	0.49 s	Reference Used:
Stop Watch	3601 s to 7200 s	0.75 s	Universal Frequency
Timer	10 s to 7200 s	0.75 s	Counter <u>UUC:</u> Function Generator, Frequency Counter, Stop Watches, <u>Method Used:</u> LLC/APCIC/WCP/01
Field of Measureme	nt: Electrical Parameters	1	
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
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	UUC: Inmel Calibrator Clamp Meter Standard Resistors
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	Method Used:  LLC/APCIC/ECP/01 LLC/APCIC/ECP/02
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 $\Omega$ to 10.00 $\Omega$ 10.01 $\Omega$ to 100.00 $\Omega$ 100.00 $\Omega$ to 1.000 k $\Omega$ 1.001 k $\Omega$ to 10.00 k $\Omega$	0.013 Ω 0.015 Ω 0.015 Ω 0.10 Ω	
Resistance	10.01 kΩ to 10.00 kΩ 100.01 kΩ to 1.000 MΩ 1.001 MΩ to 10.00 MΩ	0.10 Ω 4.7 Ω 0.54 ΚΩ 8.7 kΩ	
Insulation Resistance	10.01 MΩ to 100.0 MΩ 100.1 MΩ to 1.000 GΩ	15 kΩ	

14-03-2024 Sd Director



F-06/02

**Issue Date: 18/08/2020** 

Rev. No: 09 LAB 036

@ 250 V to 1000 V		5.0 ΜΩ	
Low Resistance Measurement	$10.0~\mathrm{m}\Omega$ to $100.0~\mathrm{m}\Omega$	0.14 mΩ	
Field of Measuremen	nt: AC Power (Single Phas	<b>e</b> )	
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 Measuremen	nt: Spectrophotometer	1	
Wavelength Accuracy	525.5 nm	0.78 nm	Reference Used: SS-1 Spectronics Standard Filters
Transmittance @ 590nm & 412 nm	6.13%T to 10.4 %T	0.011 %T	Thermo Spectronics USA UUC:
Absorbance @ 590nm & 412 nm	0.990 A to 1.209 A	0.043 A	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

14-03-2024	Sd
Date	Director
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F-06/02

Issue Date: 18/08/2020

Rev. No: 09 LAB 036

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	Sd
Date	Director