



Accreditation No. LAB 001

Awarded to

NATIONAL PHYSICAL & STANDATRDS LABORATORY.
PLOT NO.16, SECTOR H-9/1, ISLAMABAD, 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 **12-02-2004** by Pakistan National Accreditation Council. The laboratory complies with the requirements of **ISO/IEC 17025:2005**. The accreditation requires regular surveillance, and is valid until **11-02-2019**

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 (PNAC)

04-04-2017

Date

Director

(A) TESTING LABORATORY

Permanent laboratory premises (Testing Scope)

Chemical Metrology AAS / PCS / Viscosity (Water / Wastewater/ Industrial Effluents/ Solutions/ Liquids /Fluids)			
Materials/ Products Tested	Testing Field (e.g. environmental testing or mechanical testing)	Types of Tests/ properties measured	Reference to Standardized method (e.g. ISO 14577-1:2003)/ Internal method Reference
Water/ Wastewater/ Industrial Effluents	Environmental testing	Measurement of Electrical Conductivity	2510-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Total Dissolved Solids (TDS)	2540-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Total Suspended Solids (TSS)	2540-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Total Hardness	2340-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Alkalinity	2320-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Chloride	4500-C, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Calcium	3500-Ca, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
		Chemical Oxygen Demand (COD)	5220-B, Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, AWWA/APHA
Water/ Wastewater/ Industrial	Chemical and Environmental testing	Copper (Cu)	Standard Methods for the Examination of Water and Waste water, 22 nd edition, 2012, APHA, AWWA, WEF /
		Iron (Fe)	
		Lead (Pb)	

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ACCREDITATION DOCUMENT

F-06/02
Issue Date: 10/08/15
Rev. No: 07
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Effluents/ Solutions/ Liquids		Zinc (Zn)	Atomic Absorption Spectrometer, A Analyst -100, Perkin Elmer-USA / Direct method (Flame - AAS)
		Chromium (Cr)	
		Sodium (Na)	
		Potassium (K)	
		Calcium (Ca)	
		Magnesium (Mg)	
		Cadmium (Cd)	
		Nickel (Ni)	
		Manganese (Mn)	
		Cobalt (Co)	
Liquids / Fluids	Petroleum	Kinematic Viscosity	ASTM D 445-09

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(B) CALIBRATION LABORATORY

Permanent laboratory premises

(i) Field of measurement: MASS MEASUREMENTS				
Measured quantity	Range/ Capacity	Calibration & Measurement Capability (CMC) expressed as an uncertainty (±)	Brief description of measurement and equipment used	
Mass	i) 1mg to 1000 g	i) (0.001 to 0.22) mg	i) E₂, F₁ and F₂ class standard masses from 1mg to 20kg ii) Mass Comparator CCE6 having readability 0.1µg and capacity of 6.1g iii) Mass Comparator CC111 having readability 1µg and capacity of 111g iv) Mass Comparator AX1006 having readability 1µg and capacity of 1000g v) Mass Comparator CC10000U-L having readability 10µg and capacity of 10kg vi) Mass Comparator CC50001S-L having readability 1mg and capacity of 50kg	
	ii) 2000 g to 5000 g	ii) (0.37 to 0.98) mg		
	iii) 10,000 g to 20,000 g	iii) (1.8 to 5) mg		
(ii) Field of measurement: VOLUME MEASUREMENTS				
Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty(±)	Brief description of measurement and equipment used	
Micropipette	10 µL to 5000 µL	0.2 µL to 5µL	Gravimetric Method is used for the calibration of volume measures ranging from 10µL to 20 L. Three precision electronic balances are used for the calibration measures i.e. M-27, M-28 and M-39.	
Glassware	1 mL to 1000 mL	0.1mL to 3.5 mL		
Glassware	1 L to 5 L	0.004 L to 0.03 L		
Metallic	20 mL to 2000 mL	0.12 mL to 5.78 mL		
Metallic	2 L to 5 L	0.006 L to 0.017 L		
Metallic	5 L to 10 L	0.017 L to 0.029 L		
Metallic	10 L to 20 L	0.029 L to 0.050 L		
(iii-a) Field of measurement: ELECTRICAL MEASUREMENTS (Measure Mode Scope)				
Measured Quantity	RANGE	Calibration & Measurement Capability Expressed as An Uncertainty (±)	Brief description of measurement & equipment used	
			Equipment used	Method used
DC VOLTAGE	100 mV	0.00085 mV	1. Reference Standard 3458-Agilent, 34401 – Agilent, 8508- A, Fluke, Digital multi-meters (Measure) 2. Unit under test Fluke-5720-a, 9100-Wavetek, Multifunction Calibrator (source)	EMD/TPP-08 EMD/TPP-10
	1 V	0.000042 V		
	10 V	0.000037 V		
	100 V	0.00056 V		
	1000 V	0.0056 V		
DC CURRENT	100 µA	0.0019 µA	1 Reference Standard 3458-Agilent, 34401 – Agilent, 8508- A, Fluke, Digital Multi-meters	EMD/TPP-09 EMD/TPP-10
	1 mA	0.000015 mA		
	10 mA	0.00015 mA		
	100 mA	0.0019 mA		

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	3 A	0.00002 A	(Measure)	
	20 A	0.00024 A	2. Unit under test Fluke-5720-a, 9100-Wavetek Multifunction Calibrator (Source)	
AC VOLTAGE	10 mV, at 50Hz to 300Hz	0.00386 mV	1 Reference Standard 3458-Agilent, 34401 – Agilent, 8508- A, Fluke, Digital Multi-meters (Measure) 2. Unit Under Test Fluke-5720-A, 9100-Wavetek Multifunction Calibrator (Source)	EMD/TPP-08 EMD/TPP-10
	100 mV, at 50Hz to 300Hz	0.00039 mV		
	1 V, at 50 to 500Hz	0.00021 V		
	10 V, at 50 Hz to 10kHz	0.00381 V		
	100 V, at 50 Hz to 10kHz	0.0175 V		
	1000 V, at 50 Hz to 10kHz	0.028 V		
AC CURRENT	100 μ A, at 10 Hz to 1kHz	0.012 μ A	1 Reference Standard 3458-Agilent, 34401 – Agilent, 8508- A, Fluke, Digital Multi-meters (Measure) 2. Unit Under Test Fluke-5720-a, 9100-Wavetek Multifunction Calibrator (Source)	EMD/TPP-09 EMD/TPP-10
	10 mA, at 10 Hz to 1kHz	0.0013 mA		
	100 mA, at 10 Hz to 1kHz	0.013 mA		
	3 A, at 10 Hz to 1kHz	0.00013 A		
	20 A, at 10 Hz to 1kHz	0.00634 A		
RESISTANCE	10 Ω	0.00017 Ω	1 Reference Standard 3458-Agilent, 34401 – Agilent, 8508- A, Fluke, Digital Multi-meters (Measure) 2. Unit Under Test Fluke-5720-A, 9100-Wavetek Multifunction Calibrator (Source)	EMD/TPP-10 EMD/TPP-11 EMD/TPP-12
	100 Ω	0.0014 Ω		
	1 k Ω	0.0000077 k Ω		
	100 k Ω	0.00069 k Ω		
	1 M Ω	0.00001 M Ω		
	100 M Ω	0.014 M Ω		
CAPACITANCE	10 pF	0.003 pF	1 Reference Standard PM-6306 Fluke , Reference Digital Capacitance Meter (Measure) 2. Unit Under Test 9100-Wavetek, Universal Calibration System (Sources)	EMD/TPP-14
	1000 pF	3.16 pF		
	1 nF	0.001nF		
	1000 nF	2.89 nF		
	1 μ F	0.0001 μ F		
	1000 μ F	0.058 μ F		
INDUCTANCE	100 μ H	0.05 μ H	1. Fixed value working standard Inductors (source) 2. Unit under test Digital inductance/ LCR meter pm-6304 fluke, (measure)	EMD/TPP-15
	1 mH	0.0058 mH		
	10 mH	0.0058 mH		
	100 mH	0.008 mH		
	1 H	0.0001 H		

(iii-b) ELECTRICAL MEASUREMENTS (Source/Generation Scope):

Measured Quantity	Range	Calibration & measurement capability expressed as an uncertainty (\pm)	Brief description of measurement & equipment used	
			Equipment used	Method used
DC VOLTAGE	1.018 V	0.2 μ V	1. Reference Standard Fluke – 732-B, Reference DC Voltage Standard (Source) 2. Unit Under Test 3458-Agilent Reference, 8508-A, Fluke, Digital Multi-meter (Measure)	EMD/TPP-10
	10 V	0.4 μ V		
	220mV	0.00205 mV	3. Reference Standard Fluke – 5720-A Multifunction	EMD/TPP-10 EMD/TPP-08
	2.2 V	0.0000117 V		

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	11 V	0.000041 V	4. Calibrator (Source) Unit Under Test All Types OF Digital / Analog Multi-meter 3458-AGILENT, 8508-A, Fluke, 45-Fluke, ETC (Measure)	
	22 V	0.000081 V		
	220 V	0.00114 V		
	1100 V	0.00755 V		
DC CURRENT	220 μ A	0.148 μ A	1. Reference Standard Reference Standard, Fluke – 5720-A Multifunction Calibrator-9100 (Source) 2. Unit Under Test All Types OF Digital / Analog Multi-meters 3458-Agilent, 8508- A, Fluke, 45-Fluke, Clamp meter, etc (Measure)	EMD/TPP-10 EMD/TPP-09
	2.2 mA	0.000084 mA		
	22 mA	0.000811 mA		
	220 mA	0.0106 mA		
	2.2 A	0.000188 A		
	20 A, 1000 A (via current coil)	0.00408 A 0.00444 A		
AC VOLTAGE	2.2mV, at 10 Hz to 100kHz	0.02594 mV	1. Reference Standard Reference Standard, Fluke – 5720-A Multifunction Calibrator (Source) 2. Unit Under Test All Types OF Digital / Analog Multi-meters 3458-Agilent, 8508- A, Fluke, 45-Fluke, etc. (Measure)	EMD/TPP-10 EMD/TPP-08
	22 mV, at 10 Hz to 100kHz	0.0794 mV		
	220 mV, at 10 Hz to 100kHz	0.639 mV		
	2.2 V, at 10 Hz to 100kHz	0.00404 V		
	22 V, at 10 Hz to 100kHz	0.0362V		
	220 V, at 10 Hz to 100kHz	0.0568V		
	750 V, at 40 Hz to 10 kHz	0.461V		
	1100 V, at 40 Hz to 10 kHz	0.671V		
AC CURRENT	220 μ A, at 10 Hz to 10 kHz	0.307 μ A	1 Reference Standard Fluke – 5720-A Multifunction Calibrator - 9100 (Source) 2. Unit Under Test All Types of Digital / Analog Multi-meter i.e 3458-Agilent, 8508-A, Fluke, 45-Fluke, clamp meters etc (Measure)	EMD/TPP-10 EMD/TPP-09
	2.2 mA, at 10 Hz to 10 kHz	0.00307 mA		
	22 mA, at 10 Hz to 10 kHz	0.0292 mA		
	220 mA, at 10 Hz to 10 kHz	0.252 mA		
	2.2 A, at 20 Hz to 10 kHz	0.01556 A		
	20 A, at 40 Hz to 10 kHz 1000 A, at 40Hz to 1kHz (via current coil)	0.04035 A		
RESISTANCE	1 Ω	0.000095 Ω	1 Reference Standard Fluke – 5720-A Multifunction Calibrator (Source) 2. Unit Under Test All Types OF Digital / Analog Multi-meter i.e 3458-Agilent, 8508-A, Fluke, 45-Fluke, etc (Measure)	EMD/TPP-10 EMD/TPP-11
	10 Ω	0.000023 Ω		
	100 Ω	0.00001 Ω		
	1 k Ω	0.000009 k Ω		
	10 k Ω	0.000009 k Ω		
	100 k Ω	0.00001M Ω		
	1 M Ω	0.00002 M Ω		
	10 M Ω	0.00005 M Ω		
RESISTANCE	0.0001 Ω	60 $\mu\Omega$	1 Hi-Accuracy Working Standard 4-Terminal Standard Resistors 20-E/D to 28-E/D, H&B Germany (Source) 2. Unit Under Test 34420-Agilent Digital $\mu\Omega$ Meter (Measure)	EMD/TPP-12
	10 k Ω	0.008 Ω		
CAPACITANCE	0.1 μ F	0.0005 μ F	1. Fixed Value Working Standard Capacitors (Source) 2. Unit Under Test Digital Capacitance/ LCR Meter PM-6304 Fluke, (Measure)	EMD/TPP-13
	1 μ F	0.0005 μ F		
	4 μ F	0.05 % + 3 pF		
	40 μ F	0.05 %	1. Reference Standard 9100-Wavetek, Universal Calibration system (Source) 2. Unit Under Test	EMD/TPP-13
	400 μ F	0.05 %		
	4 mF	0.05 %		

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	40 mF	0.1 %	Digital Capacitance Meter LCR Meter, (Measure)	
DC POWER	20 kW	0.155 kW	1. Reference Standard 9100-Wavetek, Universal Calibration system (Source) 2. Unit Under Test Power Analyzer DW-6091 (Measure)	EMD/TPP-14
AC POWER	20 kW, at 50Hz – 1kHz	0.155 kW	1. Reference Standard Universal Calibration System 9100-Wavetek (Source) 2. Unit Under Test Power Analyzer DW-6091 - (Measure)	EMD/TPP-14
INDUCTANCE	100 μ H	0.008 μ H	1. Fixed Value Working standard Inductors (Source) 2. Unit Under Test Digital Inductance/ LCR Meter PM-6304 Fluke, (Measure)	EMD/TPP-15
	1 mH	0.006 mH		
	10 mH	0.006 mH		
	100 mH	0.006 mH		
	1 H	0.006 H		

(iv) Field of Measurement: Time & Frequency Measurements

Measured Quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty (Expanded) (\pm)	Brief description of measurement and equipment used	
			Equipment Used	Method Used
Frequency (Source)	10-MHz	6.5E-09 MHz	Reference Standards: a) Precision Test Systems GPS10RBN b) Agilent Universal Frequency Counter / Timer 53230A (Measure) Unit Under Test: Precision Test Systems RFS10F, Rb. Frequency Standard (Source)	Direct Frequency Comparison with Frequency Counter (T&FMD/TP P-03)
Frequency (Measure)	5Hz to 500Hz @ 0dBm	7.25E-04 Hz	Reference Standards: a) Precision Test Systems GPS10RBN b) Marconi Instruments, AM/FM Signal Generator 2024 (Source) c) Distribution Amplifier Unit Under Test: Agilent, Universal Frequency Counter / Timer 53230A (Measure)	Direct Frequency Comparison (T&FMD/TP P-01)
	1kHz to 500kHz @ 0dBm	8.70E-09 kHz		
	1MHz to 500MHz @ 0dBm	3.52E-09 MHz		
	1GHz to 2GHz @ 0dBm	1.66E-11 GHz		
	Time Base 10MHz	2.60E-06 MHz		
Frequency (Measure)	10Hz to 500Hz @ 0dBm	9.10E-03 Hz	Reference Standards: a) Precision Test Systems GPS10RBN b) Agilent, Universal Frequency Counter / Timer 53230A (Measure) c) Distribution Amplifier Unit Under Test: a) Marconi Instruments, AM/FM Signal	Direct Frequency Comparison with Frequency Counter (T&FMD/TP P-04)
	1kHz to 500kHz @ 0dBm	9.12E-06 kHz		
	1MHz to 500MHz @ 0dBm	2.44E-07 MHz		
	1GHz to 2GHz @ 0dBm	8.88E-10 GHz		

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	Time Base 10MHz	1.08E-07 MHz	Generator 2024 (Source)	
Time (Measure)	01s to 2-hrs.	5.40E-1 s	Reference Standards: a) Precision Test Systems GPS10RBN Unit Under Test: Casio, HS-60W-IDF Digital Stopwatch	Direct Comparison Method (T&FMD/TP P-02)

(v) Field of measurement: LENGTH AND DIMENSION MEASUREMENTS

Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty (\pm)	Brief description of measurement and equipment used
Length	Up to 300 mm	0.053 to 0.131 mm	Foot Scales using Length Comparator
	Up to -1000 mm (1Meter)	0.053 to 0.21 mm	Meter Scales using Length Comparator
	0.03-0.1 mm	0.27 to 0.28 μ m	Feeler Gauge using UMM2
	0.5-100 mm	0.24 to 0.80 μ m	Gauge Blocks using UMM2
	100-300 mm	0.24-0.28 μ m	Gauge Blocks using UMM2
	Up to 300 mm	0.8 - 3.9 μ m	Precision Glass / Dial Caliper using UMM ₁
	Up to 10 mm	6 – 6.3 μ m	Dial Indicator using UMM ₁
Diameter External Diameter Internal	Up to 200 mm Up to 25.4 mm	0.012 – 0.017 μ m 0.006 – 0.009 μ m	Digital Vernier / Micrometer / Dial Caliper using Gauge Blocks
	1 mm - 300 mm	1.03 μ m – 16.36 μ m	Cylinders using UMM ₂
	0.5 mm to 100 mm	0.6 μ m to 2 μ m	Ring Gauges using UMM ₁

(vi) Field of measurement: Pressure Metrology

MEASURED QUANTITY	RANGE	Calibration & Measurement Capability Expressed As An Uncertainty (\pm)	BRIEF DESCRIPTION OF MEASUREMENT & EQUIPMENT USED	
			EQUIPMENT USED	METHOD USED
Hydraulic Pressure (0.1 – 1100) bar	(0.1 – 35) bar	0.060 bar	Hydraulic Dead Weight Tester (P- 01) is used to calibrate Dead Weight Testers, Hydraulic Gauges and transducers. Its measurement is traceable via NML, SIRIM.	Direct Comparison
	(36 – 500) bar	0.220 bar		
	(501 – 1100) bar	0.276 bar		
Hydraulic Pressure (10 – 18000) psi	(10 – 1000) psi	1.35 psi	Hydraulic Dead Weight Tester (P- 09) is used to calibrate Dead Weight Testers, Hydraulic Gauges and transducers. Its measurement is traceable via NML, SIRIM.	Direct Comparison
	(1001 – 5000) psi	2.29 psi		
	(5001 – 10000) psi	3.70 psi		
	(10001 – 18000) psi	4.50 psi		
Pneumatic Pressure (-1 – 20) bar	(-1 – 0) bar	0.007 bar	Pneumatic Pressure Calibrator (P – 10) is used to calibrate Pneumatic/ vacuum gauges, pressure calibrator, manometers and transducers. . Its measurement is traceable via NVLAP, USA.	Direct Comparison
	(0– 10) bar	0.062 bar		
	(11 – 20) bar	0.039 bar		

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Atmospheric Pressure (0.70 – 1.10) bar	(0.70 – 1.10) bar	0.00016 bar	RPM4 Reference Barometer (P-12) is used to calibrate Barometers and Manometers. Its measurement is traceable via aZLa Fluke USA.	Direct Comparison
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(vii) Field of measurement: CONDUCTIVITY MEASUREMENTS

Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty(±)	Brief description of measurement and equipment used
Calibration of Conductivity Meter	1410 µmhos /cm	+5.2 µmhos /cm	Calibration of conductivity meters by using KCI standard solution.

(viii) Field of measurement: pH MEASUREMENTS

Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty(±)	Brief description of measurement and equipment used
pH	0-14 pH	0.02	Standard Buffer solutions / Two point calibration method

(ix) : Field of measurement: VISCOSITY MEASUREMENTS

Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty (±)	Brief description of measurement and equipment used
UBBELOHDE Viscometer Calibration	(0.003 to 500) mm ² s ⁻²	1.05 %	ASTM D 2162-06 Viscosity Standard oils

(x) Field of measurement: TEMPERATURE MEASUREMENTS

MEASURED QUANTITY	RANGE	Calibration & Measurement Capability Expressed As An Uncertainty (±)	BRIEF DESCRIPTION OF MEASUREMENT AND EQUIPMENT USED	
			EQUIPMENT USED	METHOD USED
TEMPERATURE (SOURCES) Heat Sources	-80.00 °C	0.20°C	1. REFERENCE STANDARDS:- (Black Stack Thermometer FLUKE), (Working Standard PRT FLUKE), (R-Type Thermocouple 5649 FLUKE) (Zero Point Dry Well FLUKE) (Temperature/ Pressure Calibrator 512B) 2. UNIT UNDER TEST:- All types of Heat Sources	TPP-33
	0.00 °C	0.20°C		
	100 °C	1.18°C		
	200 °C	1.14°C		
	299.3 °C	1.13°C		
	349.2 °C	1.14°C		
	399.1 °C	1.14°C		
	800.0 °C	2.00°C		
	1100 °C	2.20°C		
1150 °C	2.20°C			
LIQUID-IN-GLASS THERMOMETER	-40 °C	0.60 °C	1. REFERENCE STANDARDS:- a) Ultra Low Temperature Bath (Heart Scientific 7380)	TPP-25
	0 °C	0.12 °C		
	10 °C	0.12 °C		

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TEMPERATURE (MEASURE)	30 °C	0.12 °C	b) Liquid In Glass Thermometer (ASTM) c) High Precision Thermostatic Bath (Model: PROLABO) d) Oil Bath (HO-21S) e) Working Standard PRT (5628) f) Black Stack Digital Readout (1560) 2. UNIT UNDER TEST:- Liquid –In- Glass Thermometers	
	50 °C	0.12 °C		
	80 °C	0.20 °C		
	100 °C	1.20 °C		
	150 °C	1.20 °C		
	200 °C	1.20 °C		
THERMO-HYGROMETER TEMPERATURE /HUMIDITY (SOURCES)	20 %RH	1.38 %RH	1. REFERENCE USED:- a) RH Generator (HumiLab) b) NESLAB RTE Bath/Circulator (USA) c) Humidity and Temperature Probe (HMP75) (Viasala) 2. UNIT UNDER TEST:- All types of Thermo hygrometers	TPP-32
	30 %RH	1.38 %RH		
	40 %RH	1.38 %RH		
	50 %RH	1.74 %RH		
	60 %RH	1.74 %RH		
	70 %RH	1.86%RH		
	80 %RH	1.86%RH		
	18 °C	0.26 °C		
	20 °C	0.26 °C		
	22 °C	0.26 °C		
	24 °C	0.26 °C		
TEMPERATURE (°C) (MEASURE) PLATINUM RESISTANCE THERMOMETER (PRT)	-80 °C	0.02 °C	1. Reference Used:- a)) Working Standard PRT (5628) b) Black Stack Digital Readout (1560) c) Dry Block Calibrator ISOTECH GIMNI 700LRI d) Ultra Low Temperature Bath (7380) 2. Unit Under Test:- All types of PRT/RTD	TPP-31
	0 °C	0.06 °C		
	100 °C	0.20 °C		
	200 °C	0.22 °C		
	300 °C	0.26 °C		
	400 °C	0.31 °C		
	500 °C	0.40 °C		
600 °C	0.50 °C			
TEMPERATURE (SOURCES) THERMOCOUPLE	-40 °C	0.2°C	1. Reference Used:- a) Dry Block Calibrator (Model: Gemini700LRI) Ultra Low Temperature Bath (Model:7380 USA), E-Type Thermocouple (Serial#:2H19 Japan) b) Black Stack Digital Readout (Serial#: A8B906, Fluke USA) R-Type Thermocouple (Serial #: 2J13 ,Japan) Furnace (9112B,Fluke USA) c) Temperature/Pressure Calibrator (Model#:525BFluke USA), Working Standard PRT (Model #: 5628) d) Digital Thermometer (YEW 2575) Digital Thermometer (YEW 2572), R-Type Thermocouple Serial#:4996), Muffle Furnace (Model#:KE-6HK1200-3) e) Zero Point Dry Well (Model#:9101) f) S-Type Thermocouple (Model#:5650) 2. Unit Under Test:- a) S-Type Thermocouple b) R-Type Thermocouple c) K-Type Thermocouple	TPP-26
	0 °C	0.1°C		
	200 °C	0.2°C		
	400 °C	0.4°C		
	600 °C	0.6°C		
	800 °C	1.5°C		
	1000 °C	1.8°C		
	1100 °C	2.0°C		

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Director



CALIBRATION LABORATORY

**Onsite Accreditation Scope of National Physical & Standards Laboratory (NPSL),
 Islamabad, Pakistan.**

Mobile laboratory (Onsite Calibration)

Field of measurement: i) TEMPERATURE MEASUREMENTS			
Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty (\pm)	Brief description of measurement and equipment used
Calibration of Thermocouples	Ambient to 650 °C	1 °C to 1.5 °C	Dry block Temperature Calibrator, Digital Readout, Reference Thermometers, Zero point Dry Well.
Calibration of PRT/SPRT	Ambient to 650 °C	0.15 °C to 0.5 °C	Reference Thermometers, Digital Readout, Zero point Dry Well, Dry block Temperature Calibrator.
Calibration of Low Temperature Bath/ Heat Sources (Oven, Incubator, Dry Block, Furnace)	-80°C to 1400°C	± 0.1 °C to ± 0.5 °C	PRT, S & R Type Thermometer.
Calibration of Thermo Hygrometers	20%RH to 80%RH	1.4% RH to 1.9 %RH	RH Generator HumiLab. Humidity and Temperature Probe (VAISALA).
Field of measurement: ii) MASS MEASUREMENTS			
Measured quantity	Range	Calibration & Measurement Capability (CMC) expressed as an uncertainty (\pm)	Brief description of measurement and equipment used
Balance/ Weighing machine (On-Site Calibration)	5g to 5000g	0.01 to 1 mg	E2 class standard masses from 1mg to 5000g

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