

Laboratory

Unitech Instrumentation & Controls, 608, Prabhat Centre Annexe,
6th Floor, Sector-1A, C.B.D. Belapur, Navi Mumbai, Maharashtra

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

CC-2172

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Validity

17.03.2018 to 16.03.2020

Last Amended on 12.11.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	0 to 100 mV	0.38 % to 0.04 %	Using Portable Calibrator by Direct Method
2.	DC Current [#]	1 mA to 20 mA	1.27 % to 0.07 %	Using Portable Calibrator by Direct Method
3.	DC Resistance [#]	80 Ω to 400 Ω	3.4 % to 0.35 %	Using RTD Calibrator by Direct Method
4.	Temperature Simulation [#]			
	RTD (Pt-100)	(-) 50 $^{\circ}$ C to 400 $^{\circ}$ C	0.58 $^{\circ}$ C	Using Portable Calibrator by Direct Method
	J-Type Thermocouple	0 $^{\circ}$ C to 800 $^{\circ}$ C	0.59 $^{\circ}$ C	
	K-Type Thermocouple	0 $^{\circ}$ C to 1370 $^{\circ}$ C	0.58 $^{\circ}$ C	
	T-Type Thermocouple	(-) 100 $^{\circ}$ C to 400 $^{\circ}$ C	0.59 $^{\circ}$ C	
II.	MEASURE			
1.	DC Voltage [#]	0 mV to 100 mV	0.43 % to 0.04 %	Using Digital Multimeter/ Portable Calibrator by Direct Method
2.	DC Current [#]	1 mA to 20 mA	1.27 % to 0.13 %	Using Digital Multimeter/ Portable Calibrator / Radix (Microcal) by Direct Method

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3.	DC Resistance #	10 Ω to 400 Ω	1.27 % to 0.11 %	Using Digital Multimeter/RTD Calibrator by Direct Method
4.	Temperature Simulation #			
	RTD (Pt-100)	(-) 50 °C to 400 °C	0.25 °C	Using Portable Calibrator by Direct Method
	J-Type Thermocouple	0 °C to 800 °C	0.58 °C	
	K-Type Thermocouple	0 °C to 1370 °C	0.58 °C	
	T-Type Thermocouple	(-) 100 °C to 400 °C	0.59 °C	
5.	Digital Stop Watch #	60 s to 86400 s	3.5 s to 3.61 s	Using Stop Watch by Comparison Method

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<u>MECHANICAL CALIBRATION</u>				
I.	MASS			
1.	Weights ^{\$} F2 Class Weights and Coarser	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g	0.02 mg 0.02 mg 0.02 mg 0.025 mg 0.030 mg 0.012 mg 0.016 mg 0.02 mg 0.025 mg 0.03 mg 0.04 mg 0.05 mg 0.06 mg 0.08 mg 0.10 mg 0.16 mg 0.3 mg	Using E2 class standard weights up to 5 kg and with Digital Weighing Balance up to 80 g / 200 g of $d = 0.01$ mg and $d=0.1$ mg Using ABBA method as per OIML R- 111 : 2004
2.	Weights ^{\$} M1 Class Weights and Coarser	500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.008 g 0.016 g 0.01 g 0.025 g 0.02 g 0.1 g	Using E2 (5 kg) Class weights and F1 (>5kg) Class weights and Digital Weighing Balance up to 10 kg with $d = 10$ mg and upto 35 kg with $d = 0.1$ g
II.	WEIGHING SCALE AND BALANCE			
1.	Weighing Balances [#] Class I and Coarser	1 mg to 80 g $d \geq 0.01$ mg >80g to 200 g $d \geq 0.1$ mg	0.01 mg 0.1 mg	Using E2 class standard weights (1 mg to 5.0 kg) as per OIML R-76

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2.	Weighing Balances Class II and Coarser [#]	>200 g to 10 kg d \geq 10mg >10 kg to 35 kg d \geq 100mg	30.0 mg 150.0 mg	Using F1 class standard weights >5 kg to 20 kg as per OIML R-76
III.	VOLUME			
1.	Piston Pipette, Micro Pipettes ^{\$}	>10 μ l to 100 μ l >100 μ l to 1000 μ l >1000 μ l to 5000 μ l	0.05 μ l to 0.5 μ l 0.9 μ l to 7.00 μ l 10.0 μ l to 32.0 μ l	Using Digital Balance up to 80 g /200g readability 0.01/0.1 mg And up to 10 kg with d= 10 mg with distilled water of known density as per IS 8655-6 & ISO/TR 20461
2.	Glass Pipettes (Graduated / Non Graduated) and Glass Burette ^{\$}	1 ml to 10 ml >10 ml to 50 ml > 50 ml to 100 ml	0.02 ml to 0.03 ml 0.03 ml to 0.1 ml 0.1 ml to 0.2 ml	Using Digital Balance up to 80 g/200g readability 0.01/0.1 mg And up to 10 kg with d= 10 mg with distilled water of known density as per ISO 4787 & ISO/TR 20461
3.	Measuring Cylinder/ Volumetric Flask/ Conical Flask/ Beaker ^{\$}	5 ml to 100 ml >100 ml to 500 ml >500 ml to 1000 ml >1000 ml to 2000 ml	0.1 ml to 1.9 ml 1.9 ml to 3.5 ml 3.5 ml to 5.2 ml 5.2 ml to 10.0 ml	Using Digital Balance up to 80 g/200g readability 0.01/0.1 mg And up to 10 kg with d= 10 mg with distilled water of known density as per ISO 4787 & ISO/TR 20461
IV.	PRESSURE INDICATING DEVICES			
1.	Pneumatic Pressure Gauges [#] (Analogue/Digital)	1 bar to 7 bar (g) 1 bar to 20 bar (g)	0.2% rdg 2.05 % rdg	Using Digital Pressure Gauge by Comparison Method as per DKD-R-6-1
2.	Pneumatic Low Pressure Gauges [#] (Analogue/Digital)	20 mmWc to 200 mmWc (g) (196 Pa to 1961 Pa)	0.8% rdg	Using Digital Pressure Gauge by Comparison Method as per DKD-R-6-1

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3.	Hydraulic Pressure Gauges # (Analogue/Digital)	7 bar to 70 bar (g) 70 bar to 689 bar (g)	0.3% rdg 0.5% rdg	Using Digital Pressure Gauge by Comparison Method as per DKD-R-6-1
4.	Vaccum Gauges # (Analogue/Digital)	0 mmHg to (-) 700mmHg (g) (0 to 93325.67 Pa)	0.92% rdg	Using Digital Manometer by Comparison Method as per DKD-R-6-2

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<u>THERMAL CALIBRATION</u>				
1.	TEMPERATURE			
1.	Thermocouples, RTDs, Temperature Transmitter With Or Without Indicator / Data Logger, Digital Thermometer #	(-) 30 °C to 50 °C	0.44 °C to 0.49 °C	Using STD SPRT / PRT (Tempsens) Low Temp Bath & Temp Readout or DMM by Comparison Method
2.	Thermocouples, RTDs, Temperature Transmitter With Or Without Indicator / Data Logger, Digital Thermometer #	50 °C to 350 °C	0.45 °C to 0.46 °C	Using STD SPRT / PRT (Tempsens), Dry Block Furnace & Temp Readout or DMM by Comparison Method
3.	Liquid In Glass Thermometer #	(-) 30 °C to 250 °C	0.44 °C to 0.46 °C	Using STD SPRT / PRT (Tempsens), Low Temp Bath / Constant Temp Bath & Temp Readout Or DMM by Comparison Method
4.	Thermocouples, RTDs, Temperature Transmitter With Or Without Indicator / Data Logger, Digital Thermometer #	(-) 30 °C to 50 °C	0.59 °C	Using STD SPRT / PRT (Tempsens), Low Temp Chamber & Temp Readout or DMM by Comparison Method

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5.	Indicator of Freezers, Cold Chamber, Oven, Environment Chamber, Incubator (for Non-Medical Applications), BOD Incubator (for Non-Medical Applications) [#]	(-) 30 °C to 50 °C 50 °C to 350 °C	0.58 °C 0.46 °C	Using STD SPRT / PRT (Tempsens) & Temp Readout or DMM by Comparison Method (Single Position)
6.	Freezers, Cold Chamber, Oven, Environment Chamber [#]	(-) 30 °C to 200 °C	1.15 °C	Using Multipoint Data Logger and 4 Wire RTD (Pt-100) Sensors, Thermocouples by Mapping Method (Multi Position)
II.	SPECIFIC HEAT & HUMIDITY			
1.	Digital & Analog Hygrometers, RH Sensors / Transmitters With Controllers / Indicator / Recorder/ Data Logger, RH Sensor With Indicators [#]	30 % RH to 95 % RH @approx. 25 °C	1.53 % RH	Using STD Rotronics RH Sensor with Indicator and RH Generator by Comparison Method
2.	Humidity Indicator of Humidity Calibrator / Generator/Chamber [#]	30 % RH to 95 % RH	1.53 % RH	Using STD Rotronics RH Sensor with Indicator by Comparison Method (Single Position)

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3.	Humidity Indicator of Humidity Calibrator / Generator/Chamber #	30 % RH to 95 % RH	2.88 % RH	Using Rh Sensors, Transmitters with Data Loggers by Mapping Method (Multi Position)

* Measurement Capability is expressed as an uncertainty (\pm) at a confidence probability of 95%

\$ Only in Permanent Laboratory

The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

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