

**Laboratory** EIE Instruments Pvt. Ltd., B-14, Zaveri Industrial Estate, Singarva-Kathwada Road, Kathwada, Ahmedabad, Gujarat  
**Accreditation Standard** ISO/IEC 17025: 2005  
**Certificate Number** CC-2222 **Page** 1 of 8  
**Validity** 06.01.2018 to 05.01.2020 **Last Amended on** 22.03.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO-TECHNICAL CALIBRATION</u></b>				
<b>I.</b>	<b>SOURCE</b>			
1.	Temperature Simulation <sup>#</sup> (For Indicator, Controller, Recorder, Scanner)			
	RTD	(-) 200 °C to 850 °C	0.29 °C	Using Portable Calibrator by Simulation Method (Resistance to Temperature)
	'R' Type Thermocouple	(-) 50 °C to 1760 °C	0.70 °C	Using Portable Calibrator by Simulation Method (mV to Temperature)
	'S' Type Thermocouple	(-) 50 °C to 1760 °C	1.20 °C	
	'J' Type Thermocouple	(-) 200 °C to 1200 °C	0.40 °C	
	'K' Type Thermocouple	(-) 200 °C to 1370 °C	0.69 °C	
<b>II.</b>	<b>MEASURE</b>			
1.	Timer <sup>#</sup>	10 S to 1 minute	0.34 S	Using Digital Stop Watch by Comparison Method
		1 minute to 1 hr	1.06 S	

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 Convenor

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 Program Director

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<b><u>MECHANICAL CALIBRATION</u></b>				
1.	<b>DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>			
1.	Caliper <sup>§</sup> (Vernier/Dial/ Digimatic) L.C.: 0.01 mm <sup>φ</sup>	0 to 300 mm	9.0 $\mu$ m	Using Caliper Checker by Comparison Method
2.	External Micrometer <sup>§</sup> L.C.: 0.001 mm <sup>φ</sup>	0 to 25 mm	1.20 $\mu$ m	Using Slip Gauge grade '0' by Comparison Method
3.	Plunger Dial Gauge <sup>§</sup> L.C.: 0.001 mm <sup>φ</sup>	0 to 25 mm	3.40 $\mu$ m	Using Electronics probe and Dial Calibration Tester by Comparison Method
4.	Test Sieves <sup>§</sup>	45 $\mu$ m to 4 mm 4 mm to 125 mm	4.1 $\mu$ m 31+21 $\mu$ m $\sqrt{L}$ (L in meter)	Using Digital Profile Projector and Digital Vernier Caliper by Comparison Method
5.	Steel Scale/Ruler <sup>§</sup> L.C.: 0.5 mm and 1.0 mm	0 to 1000 mm	30 + 21 $\mu$ m $\sqrt{L}$ (L in meter)	Using Tape Calibrator by Comparison Method
6.	Measuring Tape <sup>§</sup> L.C.: 1.0 mm	0 to 50 m	51 $\mu$ m $\sqrt{L}$ (L in meter)	Using Tape Calibrator by Comparison Method
7.	Feeler Gauge <sup>§</sup>	0.03 mm to 1 mm	2.70 $\mu$ m	Using Digital Outside Micrometer by Comparison Method

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8.	Standard Foils <sup>§</sup>	0.01 mm to 1 mm	3.0 $\mu$ m	Using Digital Outside Micrometer by Comparison Method
<b>II.</b>	<b>ACCELERATION AND SPEED</b>			
1.	RPM Meter for Rotating Instruments <sup>#</sup> (Non Contact Mode)	100 rpm to 5000 rpm 5000 rpm to 20000 rpm	2.0 rpm 16 rpm	Using Digital Tachometer by Comparison Method
<b>III.</b>	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pneumatic Pressure Dial / Digital Pressure Gauges and calibrator, Pressure Transmitter, Pressure Switches <sup>#</sup>	0 to 1 bar 0 to 30 bar	0.001 bar 0.016 bar	Using Digital Pressure Gauge Comparison method as per DKD R-6-1 and NABL 122-13
2.	Hydraulic Pressure Dial / Digital Pressure Gauges and Calibrator, Pressure Transmitter, Pressure Switches <sup>#</sup>	0 to 700 bar	0.36 bar	Using Digital Pressure Gauge Comparison method as per DKD R-6-1 and NABL 122-13
3.	Vacuum Dial / Digital Vacuum Gauges / Indicators and Calibrator <sup>#</sup>	(-) 0.9 bar to 0 bar	0.001 bar	Using Digital Pressure Gauge Comparison method as per DKD R-6-1 and NABL 122-13

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<b>IV.</b>	<b>UTM, TENSION CREEP AND TORSION TESTING MACHINE</b>			
<b>1.</b>	Force*			
	Static Uniaxial Testing Machines (UTM, CTM, TTM etc.)			
	Tension	200 N to 50 kN	0.29 %	Using Class 0.5 Load Cell with Indicator as per IS 1828-1:2015
	Compression	200 N to 1000 kN	0.40 %	Using Class 0.5 & Class 1 Load Cell with Indicator as per IS 1828-1:2015
		1000 kN to 3000 kN	0.34 %	
<b>2.</b>	Force Proving Instruments <sup>§</sup> (Load Cell, Proving Ring Dynamometer) Mode of Force Compression	100 N to 5000 N	0.05 %	Using Class Dead Weight Force Machine as per IS 4169 :2014 & ISO 376:2011
<b>V.</b>	<b>MASS</b>			
<b>1.</b>	Weights Accuracy Class F1 & Coarser <sup>§</sup>	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g	0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.02 mg 0.02 mg 0.02 mg 0.03 mg	Using Standard Weights of E <sub>2</sub> Accuracy Class with Dig. Balance (Readability: 0.01 mg & 0.1mg) by Substitution Method (ABBA) as per OIML R 111 and NABL 122-02

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		10 g 20 g 50 g 100g 200 g	0.04 mg 0.04 mg 0.08 mg 0.11 mg 0.20 mg	
	Accuracy Class F2 & Coarser	500 g 1000 g 2000 g 5000 g	1.00 mg 5.00 mg 10.00 mg 12.00 mg	Using Standard Weights of F1 Accuracy Class with Dig. Balance upto 1 kg- Read. 1mg, 5kg- Read. 0.01g & 20kg - Read. 0.1g by Substitution method (ABBA) as per OIML R 111 and NABL 122-02
	Accuracy Class M1 & Coarser	10000 g 20000 g	100.00 mg 100.00 mg	
<b>2.</b>	<b>Weighing Balance<sup>s</sup></b>			
	Readability : 0.1 mg & Coarser	Up to 200 g	0.2 mg	Using Standard Weights of E <sub>2</sub> Accuracy Class as per OIML R 76-1: 2006
	Readability : 1 mg & Coarser	Up to 1000 g	2 mg	
	Readability : 10 mg & Coarser	Up to 10 kg	14.0 mg	
	Readability : 100 mg & Coarser	Up to 20 kg	0.11 g	Using Standard Weights of E <sub>2</sub> & F <sub>1</sub> Accuracy Class as per OIML R 76-1: 2006
	Readability : 1 g & Coarser	Up to 50 kg	1.1 g	
<b>VI.</b>	<b>VOLUME</b>			
<b>1.</b>	<b>Micro Pipette<sup>s</sup></b>			
		10 $\mu$ l to 100 $\mu$ l >100 $\mu$ l to 1000 $\mu$ l	0.32 $\mu$ l 3.16 $\mu$ l	Using Standard Weight of Accuracy Class E <sub>2</sub> with Digital Weighing Balance and distilled water of known density by IS 8655-6 & ISO/TR 20461 & NABL 122-04

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2.	Glass Ware Pipettes , Burette Measuring Cylinder, Flask, Beaker & Can <sup>\$</sup>	1 ml to 25 ml >25 ml to 100 ml >100 ml to 500 ml >500 ml to 2000 ml	17 $\mu$ l 30 $\mu$ l 0.11 ml 0.18 ml	Using Standard Weight of Accuracy Class E <sub>2</sub> and F1 with Digital Weighing Balance and distilled water of known density by ISO4787 & ISO/TR 20461 & NABL 122-04

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	Temperature Sensor-RTD / Thermo Couple With / Without Indicator for Deep Freezer, Oven Furnace, Cod, Incubator, Autoclave, Bath, Chamber <sup>#</sup>	(-) 80 °C to 70 °C 70 °C to 250 °C 250 °C to 400 °C 400 °C to 650 °C	0.051 °C 0.086 °C 0.23 °C 0.64 °C	Using Digital Thermometer, PRT Sensor and Read Out by Comparison Method
2.	Temperature Dial Gauge & Liquid-in-Glass Thermometer for Deep Freezer, Oven Furnace, Cod, Incubator, Autoclave, Bath, Chamber <sup>\$</sup>	(-) 80 °C to 70 °C 70 °C to 250 °C	0.076 °C 0.10 °C	Using Digital Thermometer, PRT Sensor and Read Out by Comparison Method
3.	Temperature Sensor - Thermo Couple With / Without Indicator – Individual and for Equipment Furnace <sup>#</sup>	300 °C to 1200 °C	2.32 °C	Using Digital Thermometer with S Type Thermocouple and Read Out by Comparison Method

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II.	<b>SPECIFIC HEAT &amp; HUMIDITY</b>			
1.	Humidity Sensor with Indicator <sup>#</sup>	35 to 95 % RH @ 25 °C 10 °C to 50 °C @ 50 % RH	1.62 % RH 0.37 °C	Using Humidity/ Temperature Sensor with Indicator By Comparison Method

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

<sup>§</sup> Only in Permanent Laboratory

<sup>\*</sup> Only for Site Calibration

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

<sup>ϕ</sup> Laboratory can also calibrate instruments/devices of coarser resolution / least count within the accredited range using same reference standard/ master equipment under the scope of accreditation.

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