

Laboratory Calibration Laboratory, A-Z Instrument Services, FF-8, Maruti Complex, New Channi Road, Nizampura, Vadodara, Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2677

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Validity 18.05.2018 to 17.05.2020

Last Amended on 14.08.2019

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO-TECHNICAL CALIBRATION</u></b>				
<b><u>MEASURE</u></b>				
1.	DC Voltage*	1 mV To 100 mV 100 mV to 100 V 100 V to 1000 V	0.11 % to 0.002 % 0.002 % to 0.001 % 0.001 % to 0.003 %	Using 6 ½ DMM By Direct Method
2.	AC Voltage*	<b>50 Hz</b> 10 mV to 100 mV 100 mV to 100 V 100 V to 750 V	0.058 % to 0.021 % 0.021 % to 0.01 % 0.011 %	Using 6 ½ DMM By Direct Method
3.	DC Current*	1 mA To 100 mA 100 mA to 1 A 1 A to 3 A	0.012 % to 0.006 % 0.006 % to 0.024 % 0.024 % to 0.056 %	Using 6 ½ DMM By Direct Method
4.	AC Current*	<b>50 Hz</b> 100 mA to 1 A 1 A to 3 A	0.137 % to 0.041 % 0.041 % to 0.56 %	Using 6 ½ DMM By Direct Method
5.	DC Resistance*	1 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 100 M $\Omega$	0.081 % to 0.002 % 0.001 % 0.001 % to 0.016 %	Using 6 ½ DMM By Direct Method
6.	Stop Watch*	30 to 1800 Sec.	4.73 Sec.	Using Stop Watch By Comparison Method
7.	Temperature Indicators / Controller/PID Controller / Calibrator / Temperature Transmitters / Temperature Scanner / Data loggers / Scanners			
a.	Thermocouples*			
	K -Type	(-)200 °C to 1300 °C	0.20 °C	Using Multifunction Calibrator GE Druck By Direct Method
	J -Type	(-)200 °C to 1200 °C	0.14 °C	
	R -Type	0 °C to 1760 °C	0.48 °C	

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Convenor

Battal Singh  
Program Manager

Laboratory

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	S -Type	0 °C to 1760 °C	0.48 °C	
	T -Type	(-)200 °C to 400 °C	0.17 °C	
	B -Type	600 °C to 1800 °C	0.21 °C	
	N -Type	(-)200 °C to 1300 °C	0.14 °C	
	RTD –TYPE PT-100	(-)200 °C to 800 °C	0.12 °C	
<b>SOURCE</b>				
1.	DC Voltage*	1 mV To 200 mV 200 mV to 200 V 200 V to 1000 V	0.98 % to 0.012 % 0.01 % to 0.041 % 0.041 % to 0.08 %	Using Zeal 5 ½ Digit Multi Function Calibrator By Direct Method
2.	AC Voltage*	50 Hz 6 mV to 200 mV 200 mV to 200 V 200 V to 1000 V	1.02 % to 0.16 % 0.16 % to 0.21 % 0.21 % to 0.11 %	Using Zeal 5 ½ Digit Multi Function Calibrator By Direct Method
3.	DC Current*	0.2 mA To 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 300 mA 300 mA to 3 A 1 A to 10 A	0.25 % to 0.36 % 0.36 % 0.36 % to 0.071 % 0.07 % to 0.17 % 0.17 % to 0.33 % 0.33 % to 0.118 %	Using Zeal 5 ½ Digit Multi Function Calibrator By Direct Method
4.	DC Current*	10 A to 1000 A	0.16 % to 0.82 %	Using Zeal 5 ½ Digit Multi Function Calibrator and Coil By Direct Method
5.	AC Current*	50 Hz 0.2 mA To 2 mA 2 mA to 20 mA 20 mA to 300 mA 300 mA to 3 A 1 A to 10 A	0.24 % to 0.36 % 0.36 % 0.36 % to 0.17 % 0.17 % to 0.33 % 0.33 % to 0.19 %	Using Zeal 5 ½ Digit Multi Function Calibrator By Direct Method

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6.	AC Current*	50 Hz 10 A to 1000 A	1.61 % to 1.12 %	Using Zeal 5 ½ Digit Multi Function Calibrator and Coil By Direct Method
7.	DC Resistance*	1 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 100 M $\Omega$	0.37 % to 0.02 % 0.020 % to 0.05 % 0.05 % to 1.0 %	Using Decade Resistance Box , By Direct Method
8.	Frequency*	45 Hz to 1 KHz	0.12 % to 0.06 %	Using Zeal 5 ½ Digit Multi Function Calibrator By Comparison Method
9.	Temperature Indicators / Controller/PID Controller / Calibrator / Temperature Transmitters / Temperature Scanner / Data loggers / Scanners			
a.	Thermocouples*			
	K -Type	(-)100 °C to 1370 °C	0.12 °C	Using Multifunction Calibrator GE Druck  By Direct Method
	J -Type	(-)50 °C to 1100 °C	0.10 °C	
	R -Type	0 °C to 1760 °C	0.08 °C	
	S -Type	0 °C to 1760 °C	0.06 °C	
	T -Type	(-)100 °C to 400 °C	0.10 °C	
	B -Type	600 °C to 1800 °C	0.084 °C	
	N -Type	(-)200 °C to 1280 °C	0.10 °C	
	RTD Type PT-100	(-)200 °C to 800 °C	0.068 °C	

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<b><u>MECHANICAL CALIBRATION</u></b>				
<b>1.</b>	<b>PRESSURE INDICATING DEVICES</b>			
<b>1.</b>	Pneumatic Analog / Digital Pressure Gauge/ Compound Gauge/ Differential Pressure Gauge / Pressure Transmitter / Vacuum Transmitter/ Differential Pressure Transmitter/ Pressure Switch / Manometer / Pressure Indicator/ Calibrator / Vacuum gauge/ Magnehelic Gauge*	(-)0.9 bar to 0 bar 0 bar to 20 bar	0.003 bar 0.006 bar	Using Digital Pressure Calibrator , By Comparison Method Based on DKD R 6-2/6-1
<b>2.</b>	Pneumatic Manometer / Magnehelic Gauge*	0 to 980.67 Pa	1.43 Pa	Using Digital Manometer By Comparison Method Based on DKD R 6-1
<b>3.</b>	Pneumatic Analog / Digital Pressure Gauge/ Compound Gauge/ Differential Pressure Gauge / Pressure Transmitter / Differential Pressure Transmitter/ Pressure Switch / Manometer / Pressure Indicator/ Calibrator / Magnehelic Gauge*	0 to 1 bar	0.000648 bar	Using Digital Pressure Calibrator By Comparison Method Based on DKD R 6-1

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4.	Hyd. Analog / Digital Pressure Gauge/ Pressure Transmitter / Pressure Switch /Pressure Indicator/ Calibrator *	0 to 60 bar >60 bar to 200 bar >200 bar to 420 bar	0.03 bar 0.056 bar 0.127 bar	Using Digital Pressure Calibrator By Comparison Method Based on DKD R 6-1

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	RTD / Thermocouple with and without indicators / Analog and Digital Temperature Gauges/ Temperature Transmitters / Thermistors / Digital Thermometers / Data Loggers / Recorders*	(-)20 °C to 100 °C	0.18 °C	Using SSPRT, 6 ½ Digit DMM , Multifunction Calibrator and Low Temperature Bath  By Comparison Method
2.	RTD / Thermocouple with and without indicators / Analog and Digital Temperature Gauges/ Temperature Transmitters / Digital Thermometers / Data Loggers / Recorders*	>100 °C to 300 °C >300 °C to 600 °C	0.18 °C 0.20 °C	Using SSPRT, 6 ½ Digit DMM , Multifunction Calibrator and Dry Block Temperature Bath By Comparison Method
3.	Temperature Indicators with sensors of Temp. Bath, Dry Block Temp. Bath, Liquid Bath, Furnaces, Ovens, Muffle Furnace, Temperature Chambers*	Amb. To 600°C	0.15 °C	Using SSPRT, 6 ½ Digit DMM By Comparison Method
4.	Temperature Indicators with sensors of Refrigerator /Freezer/ Cold Chambers / Cold Rooms *	(-)20°C To 35°C	0.11 °C	Using SSPRT, 6 ½ Digit DMM, By Comparison Method

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5.	Calibration of Ovens, Furnace, Chambers, Incubators, water bath, Ware house, Room mapping, Refrigerators, Deep Freezers, Cold Rooms, Autoclave *	(-)20 °C to 150 °C	1.96 °C	Using RTDs with Multichannel data logger at multipoint calibration with minimum 9 Points By Comparison method ( Mapping method)
6.	Calibration of Ovens, Furnace, Autoclave, Chambers, Incubators, Ware house, Room mapping, Refrigerators, Deep Freezers, Cold Rooms*	At 25 °C (Fix point) 20 % RH to 90 % RH	1.6 % RH	Using Portable Data Loggers 9 Nos. , multipoint calibration with minimum 9 Points By Comparison method ( Mapping method)
II.	<b>SPECIFIC HEAT &amp; HUMIDITY</b>			
1.	Thermo-Hygrometer, Hygrometer, Temperature & Humidity Indicator with Sensor, Dry & Wet bulb Thermometer, Data Loggers, Humidity Chamber*	5 °C to 50 °C @ 50% RH 35 % RH to 90 % RH @25 °C	0.55 °C 1.36 % RH	Using Digital Thermo-Hygrometer, Humidity Chamber By Comparison method

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

§ Only in Permanent Laboratory

\*Only for Site Calibration

# 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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