



NABL

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

BELZ CALIBRATION LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

5L-123, NIT, Faridabad, Haryana

in the discipline of

ELECTRO-TECHNICAL CALIBRATION

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number C-0158

Issue Date 28/06/2014



Valid Until 27/06/2016

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

Avijit Das
Program Manager

Anil Relia
Director

Prof. K. VijayRaghavan
Chairman



NABL

Department of Science & Technology, India

SCOPE OF ACCREDITATION

Laboratory **Belz Calibration Laboratory, 5L-123, NIT, Faridabad, Haryana**

Accreditation Standard **ISO/IEC 17025:2005**

Discipline **Electro-Technical Calibration** Issue Date **28.06.2014**

Certificate Number **C-0158** Valid Until **27.06.2016**

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Measured Qty / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
SOURCE			
1. DC Voltage [#]	1 mV to 300 mV	0.5% to 0.01%	Using Fluke 9100 MF Calibrator by Direct Method
	300 mV to 300V	0.01% to 0.03%	
	300 V to 1000V	0.03% to 0.014%	
2. DC Current [#]	1 μ A to 300 mA	1.5% to 0.03%	Using Fluke 9100 MF Calibrator with current Coil by Direct Method
	300 mA to 10A	0.03% to 0.12%	
	10A to 1000A	0.12% to 0.70%	
3. AC Voltage [#]	50 Hz		Using Fluke 9100 MF Calibrator by Direct Method
	10 mV to 300 mV	1.15% to 0.2%	
	300 mV to 100V 100 V to 1000V	0.2% to 0.08% 0.08%	
4. AC Current [#]	100 μ A to 300mA	0.45% to 0.12%	Using Fluke 9100 MF Calibrator with current Coil by Direct Method
	300mA to 10A	0.12% to 0.31%	
	10A to 1000A	0.31% to 0.9%	
5. RESISTANCE [#] (4 WIRE)	50 Ω	0.3%	Using Low Resistance Box (Fixed Value) by Direct Method
	100 $\mu\Omega$	0.13%	
	0.001 Ω	0.13%	
	0.01 Ω	0.13%	
	0.1 Ω	0.13%	
	1 Ω	0.13%	
(2 WIRE)	1 Ω to 4 M Ω	1.2% to 0.07%	Using Fluke 9100 MF Calibrator by Direct Method
	4 M Ω to 40 M Ω	0.07% to 0.18%	
	40 M Ω to 400 M Ω	0.18% to 0.32%	
	2G Ω	3.5%	Using Megohm Box by Direct Method
	20G Ω	3.5%	


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Measured Qty / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
6. Frequency [#]	10Hz to 10 MHz	0.07% to 0.008%	Using Fluke 9100 MF Calibrator by Direct Method
7. DC Capacitance [#]	1nF to 1mF	2.2% to 2.5%	Using Fluke 9100 MF Calibrator by Direct Method
8. DC Power [#]	10V to 1000V 1A to 19A	0.3%	Using Fluke 9100 MF Calibrator by Direct Method
9. AC Power [#] 1 ϕ , UPF to 0.5 PF	50Hz 10V to 640V 1A to 19A	0.25% to 0.85%	Using Fluke 9100 MF Calibrator by Direct Method
10. DC High Voltage [#]	1kV to 37 kV	1.9%	Using DC High Voltage Source with HV Probe by Direct/ Comparison Method
11. AC High Voltage [#]	50Hz 1kV to 28 kV	2.5%	Using AC High Voltage Source with HV Probe by Direct/ Comparison Method
12. Temperature Simulation [#]			
RTD Type	-200°C to 800°C	0.43°C	Using Fluke 9100 MF Calibrator by Direct Method
'T' Type T/C	-200°C to 400°C	0.7 °C	
'S' Type T/C	0°C to 1700°C	0.5°C	
'J' Type T/C	-200°C to 1200°C	0.3°C	
'N' Type T/C	-200°C to 1300°C	0.3°C	
'K' Type T/C	-200°C to 1300°C	0.37 °C	
'R' Type T/C	0°C to 1700°C	0.5°C	
'B' Type T/C	0°C to 1700°C	0.5°C	
'E' Type T/C	-100 °C to 600°C	0.5°C	


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Measured Qty / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
13. Oscilloscope[#]			
Time Base (Marker)	10ns to 5s	0.63%	Using Fluke 9100 MF Calibrator
Amplitude	1kHz	1.0%	
(Deflection Factor)	1M Ω		
	5mV to 120V		
SIN/SQUARE(DC)	50kHz to 20MHz	1.0%	
	50 Ω		
Bandwidth	20mV to 2.5 V		
	1kHz to 50MHz	5.5%	
<u>MEASURE</u>			
14. DC Voltage[#]	1 mV to 100 mV	0.5% to 0.01%	Using 6 $\frac{1}{2}$ DMM by Comparison /Direct method
	100 mV to 10 V	0.01% to 0.06%	
	10V to 1000V	0.06% to 0.02%	
15. DC Current[#]	1 μ A to 10mA	3.0% to 0.08%	Using 6 $\frac{1}{2}$ DMM by Comparison/Direct method
	10mA to 3A	0.08% to 0.16%	
	3A to 10A	0.16% to 0.2%	
16. AC Voltage[#]	50 Hz		Using 6 $\frac{1}{2}$ DMM by Comparison /Direct method
	10mV to 10V	0.53% to 0.12%	
	10V to 750V	0.12% to 0.18%	
17. AC Current[#]	50 Hz		Using 6 $\frac{1}{2}$ DMM by Comparison/Direct method
	50 μ A to 100mA	0.92% to 0.5%	
	10mA to 10A	0.5% to 0.25%	

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Measured Qty / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
18. Resistance [#] (4 WIRE)	1 Ω to 10 Ω	0.1% to 0.05%	Using 6 $\frac{1}{2}$ DMM by Comparison/Direct method
(2 WIRE)	10 Ω to 1 M Ω 1 M Ω to 100 M Ω 100 M Ω to 1G Ω	0.06% to 0.13% 0.13% to 0.94% 0.94% to 2.32%	Using 6 $\frac{1}{2}$ DMM by Comparison/Direct method
19. AC Resistance [#]	1 kHz 1 Ω to 1 M Ω	0.1%	Using LCR Meter by Comparison/Direct method
20. Frequency [#]	10 Hz to 1MHz	0.06%	Using 6 $\frac{1}{2}$ DMM by Direct method
21. Capacitance [#]	1kHz 1nF to 3.3 μ F	0.12% to 0.15%	Using LCR Meter by Comparison/Direct method
22. Inductance [#]	1kHz 100 μ H to 1H	0.45% to 0.8%	Using LCR Meter by Comparison/Direct method
23. Energy/Power [#] Active 1 Φ , 3 Φ UPF to 0.5PF (Lag/Lead)	50Hz Voltage 240V Current 1A/5A	1.0%	Using Power / Energy Meter Accucheck & Power Source by Comparison /Direct method
24. Stop Watch [#] (Digital / Analog)	10 s to 24 hrs.	0.19% to 0.6%	Using Digital Stop Watch by comparison/Direct method

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Measured Qty / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
25. Temperature Simulation #			
RTD Type	-200°C to 800°C	0.2 °C	
'T' Type T/C	-200°C to 400°C	0.33 °C	
'S' Type T/C	0°C to 1700°C	0.63°C	
'J' Type T/C	-200°C to 1200°C	0.49 °C	
'N' Type T/C	-200°C to 1300°C	0.65 °C	Using Temperature Indicator by Direct Method
'K' Type T/C	-200°C to 1300°C	0.66 °C	
'R' Type T/C	0 °C to 1700°C	0.63 °C	
'B' Type T/C	0°C to 1700°C	0.62 °C	
'E' Type T/C	-100 °C to 600°C	0.43 °C	
26. AC High Current#			
	50Hz 10A to 1000A	1.2% to 0.65%	Using 6½ DMM & Current Transformer by Comparison/Direct method
27. DC High Current#			
	10A to 750A	1.0%	Using 6½ DMM & Shunt by Direct Method
28. AC High Voltage#			
	50Hz 1kV to 35 kV	2.5%	Using HV Probe with DMM by Direct Method
29. DC High Voltage#			
	1kV to 37 kV	1.7%	Using HV Probe with DMM by Direct Method

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

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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