

Laboratory Standards Lab, MIS-Test Department, Hindustan Aeronautics Ltd.,
 Hyderabad, Telangana
Accreditation Standard ISO/IEC 17025: 2005
Certificate Number CC-2893 **Page** 1 of 4
Validity 19.11.2018 to 18.11.2020 **Last Amended on** -

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	MEASURE			
1.	DC Voltage ^s	0.1 V to 2 V 2 V to 20 V 20 V to 1000 V	12 ppm to 8 ppm 8 ppm to 5 ppm 5 ppm to 15 ppm	Using 1281 DMM by Direct Method
2.	DC Current ^s	100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A	130 ppm 130 ppm to 260 ppm 260 ppm to 1600ppm	Using 1281 DMM & 34461A DMM by Direct Method
3.	DC Resistance ^s	1 Ω to 10 Ω 10 Ω to 1 k Ω 1 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	4800 ppm to 20 ppm 20 ppm to 15 ppm 15 ppm to 22 ppm 22 ppm to 50 ppm 50 ppm to 450 ppm 450 ppm to 4000 ppm	Using 1281 DMM by Direct Method
4.	AC Voltage ^s	50 Hz to 1 kHz 100 mV to 100 V 100 V to 1000 V	315 ppm 315 ppm to 500 ppm	Using 1281 DMM by Direct Method
5.	AC Current ^s	50 Hz to 1 kHz 100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A	800 ppm to 600 ppm 600 ppm to 1200 ppm 1200 ppm to 2300 ppm	Using 1281 DMM & 34461A DMM by Direct Method
6.	Frequency ^s	1 Hz to 1 kHz 1 kHz to 1 MHz 1 MHz to 22 GHz	0.8 ppm to 0.05 ppm 0.05 ppm to 0.001 ppm 0.001 ppm to 0.0006 ppm	Using CNT90XL, Frequency Counter Locked with Rubidium 9475
7.	Inductance ^s	1 kHz 100 μ H to 500 μ H 500 μ H to 10 H	0.25 % to 0.08 % 0.08 % to 0.12 %	Using E4980A LCR Meter

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8.	Capacitance ^s	1 kHz 100 pF to 1nF 1nF to 1 μ F	0.5% to 0.15 % 0.15% to 0.13 %	Using E4980A LCR Meter
9.	HF & RF Power ^s	(-) 20 dBm to 13 dBm (10 MHz to 18 GHz)	0.30 dB	Using HP438A Power Meter with 8481A Sensor
II.	SOURCE			
1.	DC Voltage ^s	1 V & 10 V 1 mV to 100 mV 0.1 V to 2 V 2 V to 1000 V	14 ppm & 4 ppm 604 ppm to 15 ppm 15 ppm to 10 ppm 10 ppm	Using DC Reference Std. Fluke 732A Using Fluke Calibrator 5720A
2.	DC Current ^s	10 μ A to 100 μ A 100 μ A to 100 mA 100 mA to 2 A 2 A to 10 A	1200 ppm to 100 ppm 100 ppm to 65 ppm 65 ppm to 110 ppm 110 ppm to 480 ppm	Using Fluke Calibrator 5720A with 5725 A Amplifier
3.	DC Resistance ^s	1 Ω 10 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω 10 M Ω 100 M Ω 0.01 Ω 0.1 Ω 0.001 Ω	275 ppm 30 ppm 20 ppm 15 ppm 15 ppm 15 ppm 20 ppm 50 ppm 150 ppm 0.64 % 0.02 % 2.5 %	Using Fluke Calibrator 5720A Using Russian P310, P321, P310

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4.	AC Voltage ^s	50 Hz to 1 kHz 2mV to 100mV 100 mV to 100 V 100 V to 1000 V	2600 ppm to 280 ppm 280 ppm to 150 ppm 150 ppm to 182 ppm	Using Fluke Calibrator 5720A
5.	AC Current ^s	50 Hz to 1 kHz 100 μ A to 100 mA 100 mA to 2 A 2 A to 10 A	300 ppm 300 ppm to 400 ppm 400 ppm to 600 ppm	Using Fluke Calibrator 5720A with 5725A Amplifier
6.	Inductance ^s	1 kHz 100 μ H 500 μ H 10 mH 25 mH 100 mH 500 mH 2 H 10 H	0.25 % 0.35 % 0.25 % 0.25 % 0.10 % 0.35 % 0.35 % 0.60 %	Using Standard Inductors 1438/H GR1482D 1438/N 1438/O USSR P547T GR1482N GR1482Q GR1482T
7.	Capacitance ^s	1 kHz 0.001 μ F 0.01 μ F 0.1 μ F 1 μ F 25 pF 100 pF	0.06 % 0.06 % 0.06 % 0.06 % 0.16 % 0.06 %	Using Standard Capacitors GR1409-F GR 1409-L GR1409-T GR1409-Y USSR P535 USSR P533
8.	Frequency ^s	1 MHz and 10 MHz 10 Hz to 1 kHz 1 kHz to 100 kHz 100 kHz to 1 GHz 1 GHz to 20 GHz	0.008 ppm and 0.001 ppm 16 ppm to 0.03 ppm 0.03 ppm to 0.006 ppm 0.006 ppm to 0.0015 ppm 0.0015 ppm to 0.0006 ppm	a) Frequency Standard 9475 b) Function Generator AG33220A locked with 9475 c) Signal Generator E8257D locked with 9475

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9.	Oscilloscope ^{\$} - Level (DC) - Time Markers - Bandwidth	5 mV to 35 V 1 nsec to 1sec Upto 1 GHz	0.7 % to 0.15 % 700 ppm to 200 ppm 18 %	a) DC Calibrator 5522A b) Signal Generator E8257D & Function Generator 33220A locked with 9475
10.	HF & RF Power ^{\$}	10 MHz to 18 GHz (-) 50 dBm to 13 dBm	0.95 dB	Using Signal Generator E8257D
11.	Amplitude Modulation ^{\$}	30 % to 90 % (1 GHz, 1 kHz)	8.25 %	Using Signal Generator E8257D
12.	Frequency Modulation ^{\$}	10 kHz to 90 kHz (1 GHz, 1 kHz)	500 Hz to 6.1 kHz	Using Signal Generator E8257D

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

^{\$}Only in Permanent Laboratory