

**Laboratory** Calibration and Measurement Centre (CAMEC), RITED/QRAG, LRDE,  
C.V. Raman Nagar, Bangalore, Karnataka

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

**Certificate Number** CC-2773

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**Validity** 25.07.2018 to 24.07.2020

**Last Amended on** -

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.	DC Voltage <sup>s</sup>	329 mV to 3.2 V 3.2 V to 32 V 32 V to 329 V 329 V to 1000 V	0.0029 % to 0.0017% 0.0017% to 0.0016% 0.0016% to 0.0028% 0.0028% to 0.0024%	Using Fluke 5520A Calibrator by Direct Method
2.	AC Voltage <sup>s</sup>	<b>10 Hz to 10 kHz</b> 3 mV to 33 mV 33 mV to 33 V 33 V to 330 V  <b>50 Hz to 10 kHz</b> 330 V to 1000 V	0.49% to 0.30% 0.30% to 0.053% 0.053% to 0.04%  0.04% to 0.036%	Using Fluke 5520A Calibrator by Direct Method
3.	DC Current <sup>s</sup>	190 $\mu$ A to 3.3 mA 3.3 mA to 1.09 A 1.09 A to 20.0 A	0.031% to 0.016% 0.016% to 0.028% 0.028% to 0.12%	Using Fluke 5520A Calibrator by Direct Method
4.	AC Current <sup>s</sup>	<b>45 Hz</b> 33 $\mu$ A to 3.3 mA 3.3 mA to 330 mA 330 mA to 10.9 A  <b>45 Hz to 5 kHz</b> 33 $\mu$ A to 3.3 mA 3.3 mA to 330 mA 330 mA to 10.9 A  <b>45 Hz to 65 Hz</b> 10.9 A to 20 A	0.53% to 0.18% 0.18% to 0.10% 0.10% to 0.14%  0.18% to 0.92% 0.18% to 1.05% 0.093% to 3.5%  0.093% to 0.17%	Using Fluke 5520A Calibrator by Direct Method

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5.	Resistance <sup>s</sup> (2 wire)	2 $\Omega$ to 1.09k $\Omega$ 1.09 k $\Omega$ to 109 k $\Omega$ 109 k $\Omega$ to 1.09 M $\Omega$ 1.09 M $\Omega$ to 109 M $\Omega$ 109 M $\Omega$ to 1090 M $\Omega$	0.07% to 0.038% 0.038% to 0.0044% 0.0044% to 0.0073% 0.0073% to 0.061% 0.061% to 1.79%	Using Fluke 5520A Calibrator by Direct Method
6.	Oscilloscope <sup>s</sup> Amplitude Flatness  Bandwidth (Sine Wave)  Time Marker	1 mV to 190 V DC 600 mV to 60 V AC @1kHz  100 MHz to 6 GHz  10 ns to 10 $\mu$ s	2.91% to 0.029% 0.12%  7.73% to 10.48%  3.6 ppm	Using Fluke 9500B Calibrator by Direct Method
7.	Frequency <sup>s</sup>	10 Hz to 100 kHz 100 kHz to 10 MHz 10 MHz to 10 GHz 10 GHz to 26 GHz	2.1 ppm to 0.012 ppm 0.012 ppm to 0.008 ppm 0.008 ppm to 0.00059 ppm 0.00059 ppm	Using Frequency Standard 910R with Arbitrary Function Generator Tektronix AFG 3252 and Signal Generator E8257D by Direct Method
8.	RF Power <sup>s</sup>	<b>10MHz to 26GHz</b> -50 dBm to +10 dBm 10nW to 10mW	0.95dB to 1.46dB	Using Arbitrary Function Generator Tektronix AFG 3252, Signal Generator Agilent E8257D By Direct Method
II.	<b>MEASURE</b>			
1.	DC Voltage <sup>s</sup>	100 mV to 2 V 2V to 20V 20V to 200V	0.0011% to 0.0017% 0.0017% to 0.00084% 0.00084% to 0.00079%	Using Reference Multimeter Fluke 8508A by Direct Method

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		200V to 1000V	0.00079% to 0.00096%	
2.	AC Voltage <sup>s</sup>	<b>20Hz to 10kHz</b> 100mV to 20V  <b>45Hz to 10kHz</b> 20V to 200V 200V to 1000 V	0.30 to 0.17%  0.015 to 0.027% 0.027 to 0.016%	Using Reference Multimeter Fluke 8508A by Direct Method
3.	DC Current <sup>s</sup>	200 $\mu$ A to 20mA 20mA to 200mA 200mA to 2A 2A to 10A	0.1% to 0.0039% 0.0039% to 0.008 % 0.008 % to 0.022% 0.022% to 0.049 %	Using Reference Multimeter Fluke 8508A by Direct Method
4.	AC Current <sup>s</sup>	<b>300 Hz to 1 kHz</b> 200uA to 2mA  <b>300Hz to 10kHz</b> 20mA to 200mA 200mA to 10A	0.078% to 0.053%  0.066% to 0.15% 0.15% to 0.33%	Using Reference Multimeter Fluke 8508A by Direct Method
5.	Resistance <sup>s</sup>	2 $\Omega$ to 200 k $\Omega$ 200k $\Omega$ to 2M $\Omega$ 2M $\Omega$ to 20M $\Omega$ 20M $\Omega$ to 1G $\Omega$ .	0.031% to 0.012% 0.012% to 0.0062% 0.0062% to 0.0066% 0.0066% to 0.18%	Using Reference Multimeter Fluke 8508A by Direct Method
6.	Frequency <sup>s</sup>	10Hz to 250kHz 250kHz to 10GHz 10GHz to 26GHz	3.28 to 0.1ppm 0.1 to 0.00070ppm 0.00070ppm	Using Universal Counter Agilent 53220A & Agilent 53152A Frequency Counter, with Rubidium Frequency Standard Fluke 910R by Comparison Method

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7.	RF Power <sup>§</sup>	10MHz to 26GHz -50dBm to +10dBm 10nW to 10mW	0.27dB to 0.55dB	Using Power Meter N1913A with Power Sensors U2004A, Agilent 8487A, Agilent 8487D by Direct Method
8.	RF Attenuation <sup>§</sup>	10MHz to 18GHz 0 dB to 40 dB	0.28 dB	Using Network Analyzer Agilent E8362B by Direct Method
9.	VSWR <sup>§</sup>	50MHz to 18GHz 1.03 to 1.11	4.5 % to 6.0 %	Using Network Analyzer Agilent E8362B by Direct Method

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

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

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