Laboratory		R&D Instrument Services, # 5/3A, Pomagal III Street, Ambalnagar, Ekkattuthangal, Chennai, Tamil Nadu			
Accreditation Standard		ISO/IEC 17025:2005			
Discipline Certificate Number		Electro-Technical Calib	ration	Issue Date	15.10.2014
		C-0672		Valid Until	14.10.2016
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		Range / Frequency *Calibration Measureme Capability (±)		ent Remarks	
SO	<u>URCE</u>				
1.	DC Voltage [#]	1mV to 10mV 10mV to 100mV 100mV to 1V 1V to 10V 10V to 100V 100V to 1000V	0.37% to 0.04% 0.04% to 0.007% 0.007% to 0.004% 0.004% to 0.003% 0.003% to 0.004% 0.004% to 0.004%	Using Multi Product Calibrator 3041A by Direct method	
2.	DC Current [#]	100 μA to 1 mA 1mA to 10mA 10mA to 100mA 100mA to 1A 1A to 20A	0.09% to 0.015% 0.015% to 0.008% 0.008% to 0.009% 0.009% to 0.013% 0.013% to 0.063%	Using M Calibrato Direc	ulti Product or 3041A by t method
		20A to 100A 100A to 1000A	0.76% to 0.31% 0.31% to 0.31%	Using M Calibrate Clamp Ce me	ulti Product or 3041A & oil by Direct ethod
3.	AC Voltage [#]	50Hz 20mV to 200mV 200mV to 2V 2V to 20V 20V to 200V 200V to 700V 700V to 1000V 1kHz 20mV to 200mV	0.30% to 0.10% 0.10% to 0.08% 0.08% to 0.07% 0.07% to 0.10% 0.10% to 0.05% 0.05% to 0.08%	Using M Calibrato Direc Using M	ulti Product or 3041A by t method ulti Product
		200mV to 2V 2V to 20V 20V to 200V 200V to 700V	0.10% to 0.08% 0.08% to 0.07% 0.07% to 0.10% 0.10% to 0.21%	Calibrato Direc	t method

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4. AC Current [#]	10kHz 200mV to 2V 2V to 20V 20V to 200V 200V to 700V 20kHz 200mV to 2V 2V to 20V 20V to 20V 20V to 200V 50Hz 25μA to 200 μA 200 μA to 2mA 20mA to 20mA 20mA to 20mA 200mA to 2A 20 A to 20A	0.10% to 0.08% 0.08% to 0.07% 0.07% to 0.11% 0.11% to 0.21% 0.37% to 0.37% 0.37% to 0.40% 0.40% to 0.11% 1.3% to 0.24% 0.24% to 0.11% 0.11% to 0.11% 0.11% to 0.10% 0.10% to 0.12% 0.12% to 0.08%	Using M Calibrato Direc Using M Calibrato Direc Using M Calibrato Direc	ulti Product or 3041A by t method ulti Product or 3041A by t method ulti Product or 3041A by t method	
	20A to 100A 100A to 1000A 1kHz	0.76% to 0.31% 0.31% to 0.30%	Using M Calibrate Clamp Ce me	ulti Product or 3041A & oil by Direct ethod	
	25μA to 200 μA 200 μA to 2mA 2mA to 20mA 20mA to 200mA 200mA to 2A	2.5% to 1.4% 1.4% to 0.8% 0.8% to 0.5% 0.5% to 0.5% 0.5% to 0.62%	Using M Calibrato Direc	ulti Product or 3041A by t method	

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				ent Remarks		
5.	Frequency [#]	100 Hz to 1kHz 1kHz to 10kHz 10kHz to 100kHz 100kHz to 300kHz 300kHz to 1MHz 1MHz to 10MHz	0.001% to 0.001% 0.001% to 0.001% 0.001% to 0.001% 0.001% to 0.002% 0.002% to 0.06% 0.06% to 0.06%	Using M Calibrate Direc	ulti Product or 3041A by t method	
6.	Capacitance [#]	1kHz 1nF 10nF 20nF 50nF 100nF 1μF 10μF	0.64% 0.36% 0.46% 0.38% 0.32% 0.50% 0.74%	Using M Calibrate Direc	ulti Product or 3041A by t method	
7.	Resistance [#]	$\begin{array}{c} 0.1\Omega \text{ to } 1\Omega \\ 1\Omega \text{ to } 10\Omega \\ 10\Omega \text{ to } 10 \Omega \\ 10 \Omega \text{ to } 10 \Omega \\ 0.1 M\Omega \text{ to } 0.1 M\Omega \\ 0.1 M\Omega \text{ to } 10 M\Omega \\ 10 M\Omega \text{ to } 100 M\Omega \end{array}$	0.92% to 0.11% 0.11% to 0.06% 0.06% to 0.06% 0.06% to 2.34% 2.34% to 2.44% 2.44% to 2.44%	Using Hi DRB 740 Stability I Direc	gh Precision 00 and High DRB 8400 by t method	
8.	Temperature Simulati	on [#]				
a.	Thermocouple Type					
	К-Туре	-200°C to -140°C -140°C to 1360°C	0.43°C to 0.14°C 0.14°C to 0.49°C	Using Calibrator and Mu	Precision , Martel 3001 lti Product	
	Е-Туре	-250°C to 0°C 0°C to 1000°C	0.65°C to 0.92°C 0.92°C to 0.27°C	calibrato Direc	r 3041A by t method	

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	J-Type	-210°C to -180°C -180°C to 1200°C	0.35°C to 0.07°C 0.07°C to 0.30°C	Using Calibrator	Precision , Martel 3001	
	T-Type N-Type R-Type B-Type S-Type L-Type U-Type	-250°C to 400°C -200°C to 1300°C 0°C to 1750°C 600°C to 1820°C 0°C to 1750°C -200°C to 900°C -240°C to 600°C	0.28°C to 0.24°C 0.17°C to 0.47°C 1.0°C to 0.66°C 0.75°C to 0.65°C 0.82°C to 0.75°C 0.43°C to 0.22°C 0.65°C to 0.32°C	and Mu calibrato Direc	Iti Product or 3041A by t method	
b.	RTD Type PT -100 PT -500	-200°C to 800°C -200°C to 630°C	0.06°C to 0.09°C 0.06°C to 0.09°C	Using Tra Product	nsmille Multi Calibrator	
ME	PT -1000 <u>ASURE</u>	-200°C to 630°C	0.06°C to 0.09°C	3041A by 1	Direct method	
9.	DC Voltage [#]	1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.42% to 0.01% 0.01% to 0.006% 0.006% to 0.005% 0.005% to 0.006% 0.006%	Using Multime 34401A Direc	g Digital eter, Model Agilent by t method	
10.	AC Voltage [#]	50Hz 10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 750 V	0.54% to 0.12% 0.12% to 0.10% 0.10% to 0.10% 0.10% to 0.10% 0.10% to 0.11%	Usin Multim 34401A Direc	g Digital eter Model Agilent by t method	

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		10kHz 10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 750 V	0.54% to 0.12% 0.12% to 0.10% 0.10% to 0.10% 0.10% to 0.10% 0.10% to 0.11%	Using Multime 34401A Direc	g Digital eter Model Agilent by t method	
11.	AC Current [#]	50Hz 100 mA to 1 A 1 A to 2 A	0.12% to 0.17% 0.17% to 0.28%	Using Multime 34401A Direc	g Digital eter Model Agilent by t method	
12.	DC Current [#]	1 mA to 25 mA 25 mA to 100 mA 100 mA to 1 A 1 A to 2 A 2 A to 10 A	0.13% to 0.02% 0.02% to 0.06% 0.06% to 0.13% 0.13% to 0.17% 0.17% to 0.65%	Using Multime 34401A Agilent a Calibrator by Dire	g Digital eter Model A, 34405A nd Precision · 3001Martel ct method	
13.	Resistance [#]	1 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	0.47% to 0.016% 0.016% to 0.014% 0.014% to 0.013% 0.013% to 0.013% 0.013% to 0.014% 0.014% to 0.047% 0.047% to 0.94%	Using Multime 34401A Direc	g Digital eter Model Agilent by t method	
14.	Frequency [#]	3 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 100 kHz 100 kHz to 300 kHz	1.93% to 0.06% 0.06% to 0.06% 0.06% to 0.013% 0.013% to 0.012% 0.012% to 0.012%	Using Multime 34401A Direc	g Digital eter Model Agilent by t method	

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15.	Time Interval [#]	10 sec to 100 sec 100 sec to1000 sec 1000 sec to 2 Hr 2 Hr to 24 Hr	3.15 % to 0.77% 0.77% to 0.08% 0.08% to 0.018% 0.018% to 0.012%	Using T Make : Compari	Using Timer H5CX Make : Omron by Comparison method	
16.	Temperature Simulat	ion [#]				
a.	Thermocouple Type					
h	K -Type E - Type J – Type N - Type R - Type B - Type S - Type L - Type U - Type T - Type	-200°C to 1360°C -240°C to 1000°C -210°C to 1200°C -200°C to 1300°C 0°C to 1750°C 600°C to 1820°C 0°C to 1750°C -200°C to 900°C -200°C to 600°C -240°C to 400°C	0.54°C to 0.65°C 0.82°C to 0.34°C 0.44°C to 0.38°C 0.66°C to 0.44°C 0.98°C to 0.65°C 0.75°C to 0.65°C 0.89°C to 0.75°C 0.61°C to 0.28°C 0.92°C to 0.44°C 1.04°C to 0.23°C	Using Calibrator by Dire	Precision , Martel 3001 ect method	
D.	RTD Type PT - 100 PT -500 PT-1000	-200°C to 800°C -200°C to 630°C -200°C to 630°C	0.035°C to 0.25°C 0.063°C to 0.19°C 0.063°C to 0.19°C	Using Calibrator by Dire	Precision , Martel 3001 ect method	

* Measurement Capability is expressed as an uncertainty (±) 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.