

**Laboratory** S Calibration (Unit of Sakthi Powerr Solution Private Limited), No. 44,  
State Bank Colony, Singanallur, Coimbatore, Tamil Nadu

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

**Discipline** Electro-Technical Calibration **Issue Date** 29.09.2014

**Certificate Number** C-1132 **Valid Until** 28.09.2016

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (±)	Remarks
<b><u>SOURCE</u></b>			
<b>1. DC Voltage<sup>#</sup></b>	1 mV to 200 mV	0.45 % to 0.006 %	Using Multi Product Calibrator by Direct Method
	200 mV to 2 V	0.006 % to 0.004 %	
	2 V to 20 V	0.004 %	
	20 V to 200 V	0.004 %	
	200 V to 1000 V	0.004 %	
<b>2. DC Current<sup>#</sup></b>	100 µA to 200 µA	0.05 % to 0.03 %	Using Multi Product Calibrator by Direct Method
	200 µA to 2 mA	0.03 % to 0.02 %	
	2 mA to 20 mA	0.02 % to 0.008 %	
	20 mA to 200 mA	0.008 % to 0.02 %	
	200 mA to 2 A	0.02 %	
	2 A to 30 A	0.02 % to 0.06 %	
	20 A to 200 A	0.75 % to 0.55 %	
200 A to 1000 A	0.55 % to 0.35 %		
<b>3. AC Voltage<sup>#</sup></b>	<b>40 Hz to 1 kHz</b>		Using Multi Product Calibrator by Direct Method
	20 mV to 200 mV	0.19 % to 0.07 %	
	200 mV to 2 V	0.07 % to 0.06 %	
	2 V to 20 V	0.06 % to 0.05 %	
	20 V to 200 V	0.05 % to 0.06 %	
	200 V to 700 V	0.062 %	
	<b>50 Hz</b>		
700 V to 1000 V	0.59 %		

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4. AC Current <sup>#</sup>	<b>40 Hz to 1 kHz</b>		Using Multi Product Calibrator by Direct Method
	200 $\mu$ A to 2 mA	0.30 % to 0.10 %	
	2 mA to 200 mA	0.10 %	
	200 mA to 2 A	0.10 % to 0.15 %	
	2 A to 20 A	0.15 % to 0.20 %	
	<b>50 Hz</b>		
20 A to 200 A	0.75 % to 0.50 %	Using Multi Product Calibrator with Current coil by Direct Method	
200 A to 1000 A	0.50 % to 0.40 %		
5. Resistance <sup>#</sup>	0.1 $\Omega$ to 1 $\Omega$	6 % to 0.60 %	Using Multi Product Calibrator by Direct Method
	1 $\Omega$ to 10 $\Omega$	0.60 % to 0.07 %	
	10 $\Omega$ to 100 $\Omega$	0.07 % to 0.02 %	
	100 $\Omega$ to 1 k $\Omega$	0.02 % to 0.01 %	
	1 k $\Omega$ to 100 k $\Omega$	0.01 %	
	100 k $\Omega$ to 1 M $\Omega$	0.01 % to 0.02 %	
	1 M $\Omega$ to 10 M $\Omega$	0.02 % to 0.05 %	
	10 M $\Omega$ to 100 M $\Omega$	0.05 % to 0.6 %	
	100 M $\Omega$ to 1 G $\Omega$	0.6 % to 5.8 %	
6. Capacitance <sup>#</sup>	<b>1 kHz</b>		Using Multi Product Calibrator by Direct Method
	1 nF to 20 nF	0.40 % to 0.50 %	
	20 nF to 50 nF	0.50 % to 0.40 %	
	50 nF to 100 nF	0.40 %	
	100 nF to 1 $\mu$ F	0.40 %	
	1 $\mu$ F to 10 $\mu$ F	0.40 % to 0.75 %	
	10 $\mu$ F to 100 $\mu$ F	0.75 %	
100 $\mu$ F to 10 mF	0.75 % to 1.21 %		

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Convenor

Avijit Das  
Program Manager

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7. Inductance <sup>#</sup>	<b>1 kHz</b> 1 mH to 10 mH 10 mH to 10 H	0.60 % 0.60 %	Using Multi Product Calibrator by Direct Method
8. Frequency <sup>#</sup>	1 Hz to 100 Hz 100 Hz to 10 MHz	0.61 % to 0.06 % 0.06 % to 0.0023 %	Using Multi Product Calibrator by Direct Method
9. DC Power <sup>#</sup>	2 W to 1.5 kW (20 V to 500 V) (0.1 A to 30 A)	0.40 % to 0.07 %	Using Multi Product Calibrator by Direct Method
10. AC Power <sup>#</sup>	<b>50 Hz, UPF</b> 2 W to 1.5k W (20 V to 500 V) (0.1 A to 30 A)	0.04 % to 0.03 %	Using Multi Product Calibrator by Direct Method
11. Temperature Simulation <sup>#</sup>			
a. Thermocouple Type			
12. J – Type	-210 °C to 0 °C 0 °C to 1200 °C	0.30 °C to 0.20 °C 0.20 °C to 0.25 °C	Using Multi Product Calibrator by Direct Method
K – Type	-100 °C to 0 °C 0 °C to 1000 °C 1000 °C to 1370 °C	0.20 °C to 0.30 °C 0.20 °C 0.30 °C to 0.35 °C	

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b>T – Type</b>	-250 °C to 0 °C 0 °C – 400 °C	0.75 °C to 0.15 °C 0.15 °C	Using Multi Product Calibrator by Direct Method
<b>R – Type</b>	0 °C to 400 °C 400 °C to 1760 °C	0.96 °C to 0.55 °C 0.55 °C to 0.60 °C	
<b>S – Type</b>	0 °C to 400 °C 400 °C to 1760 °C	0.96 °C to 0.55 °C 0.55 °C to 0.60 °C	
<b>B – Type</b>	600 °C to 1000 °C 1000 °C to 1820 °C	0.88 °C to 0.78 °C 0.78 °C to 0.70 °C	
<b>E – Type</b>	-250 °C to 1000 °C	0.60 °C to 0.20 °C	
<b>N – Type</b>	-200 °C to 1300 °C	0.50 °C to 0.30 °C	
<b>C – Type</b>	0 °C to 1000 °C 1000 °C to 2316 °C	0.40 °C 0.40 °C to 0.80 °C	
<b>b. RTD</b>			
<b>13. PT-100</b>	-100 °C to 0 °C 0 °C to 800 °C	0.08 °C to 0.06 °C 0.06 °C to 0.10 °C	Using Multi Product Calibrator by Direct Method

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (±)	Remarks
<b>MESURE</b>			
<b>14. DC Voltage<sup>\$</sup></b>	1 mV to 10 mV	0.50 % to 0.05 %	Using 6.5 Digit Multimeter by Direct Method
	10 mV to 100 mV	0.05 % to 0.01 %	
	100 mV to 1 V	0.01 % to 0.005 %	
	1 V to 10 V	0.005 % to 0.0064 %	
	10 V to 100 V	0.0064 % to 0.01 %	
	100 V to 1000 V	0.01 % to 0.012 %	
<b>15. AC Voltage<sup>\$</sup></b>	<b>50 Hz to 1 kHz</b>		Using 6.5 Digit Multimeter by Direct Method
	20 mV to 100 mV	0.35 % to 0.12 %	
	100 mV to 1 V	0.12 %	
	1 V to 10 V	0.12 %	
	10 V to 100 V	0.12 %	
	100 V to 750 V	0.12 %	
<b>16. DC Current<sup>\$</sup></b>	10 µA to 100 µA	0.40 % to 0.09 %	Using 6.5 Digit Multimeter by Direct Method
	100 µA to 1 mA	0.09 % to 0.07 %	
	1 mA to 10 mA	0.07 % to 0.081 %	
	10 mA to 100 mA	0.081 % to 0.07 %	
	100 mA to 1 A	0.07 % to 0.15 %	
	1 A to 10A	0.15 % to 0.20 %	
<b>17. AC Current<sup>\$</sup></b>	<b>40 Hz to 1 kHz</b>		Using 6.5 Digit Multimeter by Direct Method
	1 mA to 10 mA	0.20 % to 0.25 %	
	10 mA to 100 mA	0.25 % to 0.20 %	
	100 mA to 1 A	0.20 %	
	1 A to 10 A	0.20 % to 0.30 %	

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18. Resistance <sup>s</sup>	1 $\Omega$ to 10 $\Omega$	0.50 % to 0.06 %	Using 6.5 Digit Multimeter by Direct Method
	10 $\Omega$ to 100 $\Omega$	0.06 % to 0.02 %	
	100 $\Omega$ to 1 k $\Omega$	0.02 % to 0.015 %	
	1 k $\Omega$ to 10 k $\Omega$	0.015 %	
	10 k $\Omega$ to 100 k $\Omega$	0.015 %	
	100 k $\Omega$ to 1 M $\Omega$	0.015 %	
	1 M $\Omega$ to 10 M $\Omega$	0.015 % to 0.05 %	
	10 M $\Omega$ to 100 M $\Omega$	0.05 % to 0.95 %	
19. Frequency <sup>s</sup>	3 Hz to 100 Hz	0.12 % to 0.012 %	Using 6.5 Digit Multimeter by Direct Method
	100 Hz to 300 kHz	0.012 %	
20. Time <sup>s</sup>	5 sec to 10000 sec	0.80 % to 0.11 %	Using Digital Timer by Direct Method
21. Temperature Simulation <sup>s</sup>			
a. Thermocouple Type			
J – Type	-200 $^{\circ}$ C to 0 $^{\circ}$ C	0.34 $^{\circ}$ C to 0.24 $^{\circ}$ C	Using Multi Product Calibrator by Direct Method
	0 $^{\circ}$ C to 1200 $^{\circ}$ C	0.24 $^{\circ}$ C to 0.26 $^{\circ}$ C	
K – Type	-190 $^{\circ}$ C to 0 $^{\circ}$ C	0.40 $^{\circ}$ C to 0.20 $^{\circ}$ C	
	0 $^{\circ}$ C to 1370 $^{\circ}$ C	0.20 $^{\circ}$ C to 0.35 $^{\circ}$ C	
T – Type	-240 $^{\circ}$ C to 0 $^{\circ}$ C	0.80 $^{\circ}$ C to 0.20 $^{\circ}$ C	
	0 $^{\circ}$ C to 400 $^{\circ}$ C	0.20 $^{\circ}$ C	
R – Type	0 $^{\circ}$ C to 1760 $^{\circ}$ C	1.08 $^{\circ}$ C to 0.70 $^{\circ}$ C	
S – Type	0 $^{\circ}$ C to 1760 $^{\circ}$ C	1.08 $^{\circ}$ C to 0.70 $^{\circ}$ C	

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<b>Quantity Measured/ Instrument</b>	<b>Range / Frequency</b>	<b>*Calibration Measurement Capability (<math>\pm</math>)</b>	<b>Remarks</b>
<b>B – Type</b>	600 °C to 1000 °C 1000 °C to 1820 °C	1.08 °C to 0.70 °C 0.70 °C	Using Multi Product Calibrator by Direct Method
<b>E – Type</b>	-240 °C to -25 °C -25 °C to 1000 °C	0.70 °C to 0.20 °C 0.20 °C to 0.25 °C	
<b>N – Type</b>	-190 °C to -25 °C -25 °C to 1300 °C	0.60 °C to 0.30 °C 0.30 °C	
<b>C – Type</b>	10 °C to 1000 °C 1000 °C to 2316 °C	0.50 °C 0.50 °C to 0.90 °C	
<b>b. RTD</b>			
<b>(PT-100)</b>	-200 °C to 0 °C 0 °C to 600 °C	0.15 °C 0.15 °C to 0.30 °C	Using 6.5 Digit Multimeter by Direct Method
<b>22. DC Voltage*</b>	1 mV to 100 mV 100 mV to 1 V 1 V to 1000 V	1 % to 0.025 % 0.025 % to 0.020 % 0.020 %	Using 5.5 Digit Multimeter by Direct Method
<b>23. AC Voltage*</b>	<b>45 Hz to 1 kHz</b> 20 mV to 100 mV 100 mV to 100 V 100 V to 750 V	0.85 % to 0.40 % 0.40 % 0.40 %	Using 5.5 Digit Multimeter by Direct Method
<b>24. DC Current*</b>	10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.08 % to 0.07 % 0.07 % to 0.30 % 0.30 %	Using 5.5 Digit Multimeter by Direct Method

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (±)	Remarks
25. AC Current *	<b>50 Hz to 1 kHz</b> 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.70 % 0.70 % to 2.50 % 2.50 % to 1.50 %	Using 5.5 Digit Multimeter by Direct Method
26. Resistance*	1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	0.20 % to 0.07 % 0.07 % to 0.06 % 0.06 % to 0.07 % 0.07 % 0.07 % to 0.40 % 0.40 % to 3.50 %	Using 5.5 Digit Multimeter by Direct Method
27. Frequency*	10 Hz to 600 kHz 600 kHz to 800 kHz	0.07 % 0.07 %	Using 5.5 Digit Multimeter by Direct Method
28. Temperature Simulation*			
a. Thermocouple Type			
J – Type	-100 °C to 1200 °C	0.50 °C to 0.40 °C	Using Multifunction Calibrator by Direct Method
K – Type	-100 °C to 1300 °C	0.70 °C	
T – Type	-100 °C to 400 °C	0.70 °C to 0.30 °C	
R – Type	500 °C to 1700 °C	2 °C	
S – Type	500 °C to 1750 °C	2 °C	
B – Type	600 °C to 1800 °C	1.80 °C to 2 °C	

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N – Type	-100 °C to 1000 °C	0.95 °C to 0.50 °C	Using Multifunction Calibrator by Direct Method
E – Type	-100 °C to 1000 °C	0.30 °C	
<b>b. RTD</b>			
<b>PT-100</b>	-200 °C to 0 °C 0 °C to 600 °C	0.20 °C 0.20 °C to 0.30 °C	Using Multifunction Calibrator by Direct 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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