

## Scope of Accreditation for Calibration

**Laboratory Name :** Calibration Laboratory

**Inctech Metrological Center Company limited**

**Premises :** 99/127 Moo 2, Saimai Road, Saimai, Bangkok

**Accreditation No. :** CALIBRATION 0095

**Laboratory Status :**  Permanent  Site  Temporary  Mobile

Field of Measurement	Parameter/Range/Item	Best Measurement Capability*	Standard/Technique/Method/Equipment/Remark
1 Electrical	Measuring instrument		
	DC Voltage		In-house method : CP-DMM-01 by direct measurement with multifunction calibrator
	0 mV to < 320 mV	70 $\mu$ V/V + 8.7 $\mu$ V	
	320 mV to < 3.2 V	70 $\mu$ V/V + 50 $\mu$ V	
	3.2 V to < 32 V	77 $\mu$ V/V + 0.50 mV	
	32 V to < 320 V	77 $\mu$ V/V + 7.8 mV	
	320 V to < 1 kV	71 $\mu$ V/V + 63 mV	
	AC Voltage		
	10 mV to < 32 mV		
	@ 40 Hz to < 3kHz	0.53 mV/V + 0.12 mV	
	@ 3 kHz to < 10 kHz	0.52 mV/V + 0.15 mV	
	@ 10 kHz to < 30 kHz	0.84 mV/V + 0.28 mV	
	@ 30 kHz to < 50 kHz	1.4 mV/V + 0.56 mV	
	@ 50 kHz to 100 kHz	2.5 mV/V + 1.5 mV	

\* expressed as an uncertainty ( $\pm$ ) which for k = 2, providing a level of confidence of approximately 95%

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Field of Measurement	Parameter/Range/Item	Best Measurement Capability*	Standard/Technique/Method/Equipment/Remark
1 Electrical (cont.)	Measuring instrument AC Voltage (cont.) 32 mV to < 320 mV @ 40 Hz to < 3kHz @ 3 kHz to < 10 kHz @ 10 kHz to < 30 kHz @ 30 kHz to < 50 kHz @ 50 kHz to 100 kHz 320 mV to < 3.2 V @ 40 Hz to < 3kHz @ 3 kHz to < 10 kHz @ 10 kHz to < 30 kHz @ 30 kHz to < 50 kHz @ 50 kHz to 100 kHz	   0.51 mV/V + 27 $\mu$ V 0.50 mV/V + 33 $\mu$ V 0.76 mV/V + 61 $\mu$ V 1.2 mV/V + 0.12 mV 2.4 mV/V + 0.30 mV  0.51 mV/V + 0.26 mV 0.50 mV/V + 0.33 mV 0.76 mV/V + 0.58 mV 1.2 mV/V + 1.7 mV 2.4 mV/V + 3.2 mV	   In-house method : CP-DMM-01 by direct measurement with multifunction calibrator

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1 Electrical (cont.)	Measuring instrument  AC Voltage (cont.)  3.2 V to < 32 V  @ 40 Hz to < 3kHz  @ 3 kHz to < 10 kHz  @ 10 kHz to < 30 kHz  @ 30 kHz to < 50 kHz  @ 50 kHz to 100 kHz  32 V to < 105 V  @ 40 Hz to < 3kHz  @ 3 kHz to < 10 kHz  @ 10 kHz to < 30 kHz  @ 30 kHz to < 50 kHz  @ 50 kHz to 100 kHz	    0.51 mV/V + 2.7 mV  0.72 mV/V + 3.3 mV  0.97 mV/V + 6.1 mV  1.9 mV/V + 17 mV  4.1 mV/V + 39 mV    0.51 mV/V + 9.4 mV  0.72 mV/V + 12 mV  0.97 mV/V + 20 mV  1.9 mV/V + 39 mV  4.1 mV/V + 0.13 V	    In-house method :  CP-DMM-01 by direct measurement with multifunction calibrator
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1 Electrical (cont.)	Measuring instrument AC Voltage (cont.) 105 V to < 320 V @ 55 Hz to < 100 Hz @ 100 Hz to < 1 kHz @ 1 kHz to < 3 kHz @ 3 kHz to < 10 kHz @ 10 kHz to < 20 kHz @ 20 kHz to 30 kHz 320 V to < 800 V @ 40 Hz to < 100 Hz @ 100 Hz to < 1 kHz @ 1 kHz to < 3 kHz @ 3 kHz to < 10 kHz	0.61 mV/V + 28 mV 0.61 mV/V + 28 mV 0.95 mV/V + 27 mV 0.95 mV/V + 40 mV 1.4 mV/V + 58 mV 1.8 mV/V + 75 mV  0.61 mV/V + 75 mV 0.61 mV/V + 81 mV 0.95 mV/V + 81 mV 0.95 mV/V + 0.13 V	In-house method : CP-DMM-01 by direct measurement with multifunction calibrator

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1 Electrical (cont.)	Measuring instrument		In-house method : CP-DMM-01 by direct measurement with multifunction calibrator
	AC Voltage (cont.)		
	320 V to < 800 V	1.5 mV/V + 0.19 V	
	@ 10 kHz to 20 kHz		
	800 V to 900 V	0.61 mV/V + 0.16 V	
	@ 40 Hz to < 100 Hz		
	@ 100 Hz to < 1 kHz	0.61 mV/V + 0.16 V	
	@ 1 kHz to < 3 kHz	0.95 mV/V + 0.16 V	
	@ 3 kHz to 10 kHz	0.95 mV/V + 0.25 V	
	AC Current		
30 µA to < 32 µA			
@ 55 Hz to < 3 kHz	0.89 mA/A + 1.1 µA		
@ 3 kHz to 5 kHz	1.3 mA/A + 2.1 µA		

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1 Electrical (cont.)	Measuring instrument		In-house method : CP-DMM-01 by direct measurement with multifunction calibrator
	AC Current (cont.)		
	32 $\mu$ A to < 3.2 mA	0.89 mA/A + 3.5 $\mu$ A	
	@ 55 Hz to < 3 kHz	1.3 mA/A + 7.0 $\mu$ A	
	@ 3 kHz to 5 kHz		
	3.2 mA to < 32 mA	0.89 mA/A + 13 $\mu$ A	
	@ 55 Hz to < 3 kHz	1.3 mA/A + 15 $\mu$ A	
	@ 3 kHz to 5 kHz		
32 mA to < 320 mA	1.2 mA/A + 0.26 mA		
@ 55 Hz to < 3 kHz	2.7 mA/A + 0.47 mA		
@ 3 kHz to 5 kHz			
320 mA to < 3.2 A			
@ 55 Hz to < 3 kHz	1.2 mA/A + 0.63 mA		

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1 Electrical (cont.)	Measuring instrument		In-house method : CP-DMM-01 by direct measurement with multifunction calibrator
	AC Current (cont.)		
	3.2 A to < 10 A @ 55 Hz to < 3 kHz	2.4 mA/A + 3.7 mA	
	DC Current		
	0 µA to < 320 µA	2.6 mA/A + 20 nA	
	320 µA to < 3.2 mA	2.6 mA/A + 0.13 µA	
	3.2 mA to < 32 mA	2.6 mA/A + 1.7 µA	
	32 mA to < 300 mA	3.3 mA/A + 18 µA	

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1 Electrical (cont.)	Measuring instrument  DC Resistance  10 Ω to < 40 Ω  40 Ω to < 400 Ω  400 Ω to < 4 kΩ  4 kΩ to < 40 kΩ  40 kΩ to < 400 kΩ  400 kΩ to < 4 MΩ  4 MΩ to < 40 MΩ  40 MΩ to < 100 MΩ	   0.29 mΩ/Ω + 12 mΩ  0.24 mΩ/Ω + 2.4 μΩ  0.18 mΩ/Ω + 93 mΩ  0.29 mΩ/Ω + 0.93 Ω  0.29 mΩ/Ω + 11 Ω  0.75 mΩ/Ω + 0.24 kΩ  1.8 mΩ/Ω + 2.9 kΩ  3.1 mΩ/Ω + 47 kΩ	   In-house method :  CP-DMM-01 by direct measurement with multifunction calibrator

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2 Dimension	Vernier, dial, and digital caliper 0 mm to 200 mm	13 $\mu\text{m}$	In-house method : CP-VER-01A based on JIS B 7507 : 1993
	Outside micrometer 0 mm to 25 mm	0.65 $\mu\text{m}$	In-house method : CP-MIC-01A based on JIS B 7502 : 1994

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Date of Issue : August 2006

Signature :

(Damri Sukhotanang)  
Deputy Permanent Secretary  
Chairman, Ministerial Cluster  
for Industrial and Entrepreneurial Promotion  
Chairman of Industrial Product Standards Council

Initial Date of Issue August 2006

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