

Schedule

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Certificate No. : LA-1999-0160-C
Issue No. : 24
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FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES / INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION AND MEASUREMENT CAPABILITY (CMC*)
A. Dimensional		
1. External Micrometer (Lab / Site) 0 – 200 mm > 200 – 500 mm > 500 – 1000 mm	In-house Procedure MDCP -01 : 2020 BS 870 : 2008 JIS B 7502 : 2016 ISO 3611 : 2010	0.3µm 2 µm 4 µm
2. Caliper (Lab / Site) 0 – 1000mm	In-house Procedure MDCP -02 : 2020 BS 887 : 2008 JIS B 7507:2016 ISO 13385-1 : 2011	7 µm
3. Depth Micrometer 0 – 300 mm	In-house Procedure MDCP -03 : 2020 BS 6468 : 2008 JIS B 7544 : 1994	1 µm
4. Internal & Stick Micrometer 0 – 200 mm > 200 – 500 mm > 500 – 1000 mm	In-house Procedure MDCP -04 : 2020 BS 959 : 2008	2 µm 3 µm 4 µm
5. Height Setting Micrometer & Riser Block 0 – 600 mm	In-house Procedure MDCP -05 : 2020 ISO 7863 : 1984	0.7 µm
6. Caliper Checker 0 – 600 mm	In-house Procedure MDCP -06 : 2020	0.9 µm

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7. Vernier Height Gauge (Lab / Site) 0 – 600 mm	In-house Procedure MDCP -07 : 2020 BS 1643 : 2008 JIS B 7517:1993 ISO 13225 : 2012	10 μ m
8. Vernier Depth Gauge 0 – 600 mm	In-house Procedure MDCP -08 : 2020 BS 6365 : 2008 ISO 13385-2 : 2011	10 μ m
9. Dial Indicator 0 – 30 mm 30 – 100 mm	In-house Procedure MDCP -09 : 2020 BS 907 : 2008 JIS B 7503 :1997 DIN 879 Part 1 and Part 3 :1999 DIN 878 : 2006 ASME/ANSI B89.1.10M : 2001 ISO 463 : 2006	0.5 μ m 0.8 μ m
10. Dial Test Indicator 0 – 3 mm	In-house Procedure MDCP -10 : 2020 BS 2795 : 1981 JIS B 7533:2015 ISO 9493 : 2010	0.5 μ m
11. Digimatic Indicator (Lab / Site) 0 – 20 mm 20 – 100 mm	In-house Procedure MDCP -11 : 2020	0.6 μ m 1.6 μ m
12. Plain Plug Gauge / Pin Gauge Up to 10 mm 10 – 100 mm 100 – 200 mm	In-house Procedure MDCP -12 : 2020 BS 969 : 2008	0.5 μ m 0.8 μ m 1.0 μ m
13. Plain Ring Gauge 1 – 100 mm 100 – 200 mm	In-house Procedure MDCP -13 : 2020 BS 969 : 2008	0.7 μ m 1.4 μ m

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14. Thread Ring Gauge > M2.5 – M50	In-house Procedure MDCP -14 : 2020 ISO 1502:1996 ISO 228-1: 2000 ISO 228-2 : 1987 FED – STD - H28:1978 ASME/ANSI B 1.2-1983 ASME/ANSI B1.16M – 1984 ASME/ANSI B1.22M-1985 JIS B 0251 : 2008 JIS B 0254 : 2011 JIS B 0255 : 1998 JIS B 0261 : 2004 BS 919 Part 1 to 4 : 2007 BS 84 : 2007 BS 93 : 2008 BS 1580 Part 1 : 2007 BS 1580 Part 3 : 2007 BS 3643 Part 1 & 2 : 2007	2 μ m
15. Thread Plug Gauge > M1 – M50	In-house Procedure MDCP -15 : 2020 ISO 1502:1996 ISO 228-1: 2000 ISO 228-2 : 1987 FED – STD - H28:1978 ASME/ANSI B 1.2-1983 ASME/ANSI B1.16M – 1984 ASME/ANSI B1.22M-1985 JIS B 0251 : 2008 JIS B 0254 : 2011 JIS B 0255 : 1998 JIS B 0261 : 2004 BS 919 Part 1 to 4 : 2007 BS 84 : 2007 BS 93 : 2008 BS 1580 Part 1 : 2007 BS 1580 Part 3 : 2007 BS 3643 Part 1 & 2 : 2007 BS 4377 : 1991	Pitch Dia : 2 μ m Major Dia : 2 μ m Pitch: 5 μ m Angle : 10 mins

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16. Feeler Gauge/ Calibration Foil / SHIM Up to 5 mm	In-house Procedure MDCP -16 : 2020 BS 957 : 2008 JIS B 7524 : 2008	0.7 μm
17. Surface Plate (Lab / Site)	In-house Procedure MDCP -17 : 2020 BS 817 : 2008	2 μm
18. Profile Projector (Lab / Site) 50 mm 50 – 300 mm	In-house Procedure MDCP -18 : 2020 JIS B 7184 : 1999	3 μm 4 μm
19. Dial Thickness Gauge	In-house Procedure MDCP -24 : 2020	1 μm
20. Bore Gauge	In-house Procedure MDCP -25 : 2020 JIS B 7515 : 1982	2 μm
21. Setting Master	In-house Procedure MDCP -26 : 2020	2 μm
22. Straight Edge	In-house Procedure MDCP -27 : 2020 BS 5204-1 : 1975 BS 5204-2 : 1977 DIN 874 – 1 & 2 : 2003 JIS B 7514:1977	3.1 μm
23. Linear Height Gauge (Lab/Site)	In-house Procedure MDCP -29 : 2020	2 μm
24. Holtest Measuring Face: 0 – 50 mm 50 – 100 mm 100 – 150 mm Lead Screw	In-house Procedure MDCP -23 : 2020 DIN 863 : Part 4 : 1999 & DIN 2250 : Part 1 : 2008	 1.9 μm 3.5 μm 5.1 μm 0.9 μm
25. Universal Length Measuring Machine (Lab / Site)	In-house Procedure MDCP -36 : 2020	0.3 μm

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26. Setting Rod 25 – 100 mm 100 – 400 mm 400 – 600 mm 600 – 1000 mm	In-house Procedure MDCP -34 : 2020 BS 870 : 2008 JIS B 7502 : 2016 ISO 3611 : 2010	0.8 μ m 0.9 μ m 1.1 μ m 1.2 μ m
27. Bevel Protractor Up to 300 mm 0 - 360 °C	In-house Procedure MDCP -39: 2020 BS 1685 : 2008	1.5 μ m 5 min
28. Measuring Microscope (Lab / Site)	In-house Procedure MDCP -22 : 2020 JIS B 7153 : 1995	2 μ m
29. Dial Gauge Calibrator 0 – 100 mm	In-house Procedure MDCP -40 : 2020	0.19 μ m
30. Gauge Block > 0.5 – 10 mm > 10 – 25 mm > 25 – 50 mm > 50 – 75 mm > 75 – 100 mm (Dissimilar & Similar Material)	In-house Procedure MDCP -38 : 2020 ISO 3650 : 1998 BS 4311-1 : 2007	0.05 μ m 0.06 μ m 0.08 μ m 0.10 μ m 0.12 μ m
31. Sine Bar 0 – 300 mm	In-house Procedure MDCP -21 : 2020 JIS B 7523 : 1977	1.5 μ m
32. Screw Thread Micrometer	In-house Procedure MDCP -28 : 2020 BS 870 : 2008 as a guide ISO 3611 : 2010	1.0 μ m
33. Precision Levels Up to 300 mm - Spirit Level - Inclinator Level Gauge	In-house Procedure MDCP -33: 2020 BS 958 : 1968 JIS B 7510 : 1993	0.3 Division 0.1 degree

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34. Layout Measurement Linear Angle	In-house Procedure MDCP -37 : 2020	0.5 μm 10 mins
35. Vee Block	In-house Procedure MDCP -41: 2020 BS 3731 : 1987 JIS B 7540 : 1972	2 μm
36. MU Checker	In-house Procedure MDCP -42 : 2020 JIS B 7536 : 1982	0.2 μm
37. Precision Square 0 – 450 mm	In-house Procedure MDCP -43 : 2020 BS 939 : 2007 JIS B 7526 : 1995 JIS B 7539 : 1971	3 μm
38. Caliper Gauge (Lab / Site)	In-house Procedure MDCP -44 : 2020	1 μm
39. Dial Gauge Stand	In-house Procedure MDCP -45 : 2020	0.9 μm
40. Calibration Tester	In-house Procedure MDCP -46 : 2020	0.3 μm
41. Internal Micrometer (2-leg type)	In-house Procedure MDCP -47 : 2020	2 μm
42. Steel Rule	In-house Procedure MDCP -49 : 2020 BS 4372 : 1968 JIS B 7516 : 2005	10 μm
43. Centre Bench	In-house Procedure MDCP -50 : 2020	3 μm
44. Coating Thickness Gauge Up to 1000 μm	In-house Procedure MDCP -54 : 2020	0.5 μm
45. Roughness Machine Ra (Lab / Site)	In-house Procedure MDCP -56 : 2020	0.021 μm 0.06 μm
46. Roughness Specimen Ra	In-house Procedure MDCP -56 : 2020	0.021 μm 0.06 μm

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47. Roundness Machine (Lab / Site)	In-house Procedure MDCP -57: 2020	0.06 μm
48. Parallel Bars	In-house Procedure MDCP -58: 2020 BS 906-1 & 2 : 1972	2.0 μm
49. Co-ordinate Measuring Machine (Lab / Site) 0 – 500 mm 0 – 1000 mm 0 – 1500 mm	In-house Procedure MDCP -59 :-2020 ISO 10360 : Part 2 : 2009	3.3 μm 6.2 μm 8.2 μm
50. Micrometer Head	In-house Procedure MDCP -63 : 2020 BS 1734 : 1951 DIN 863 : Part 4 : 1999 JIS B 7502 : 2016	0.9 μm
51. Gauge Block Comparator (Lab / Site) 0.5 mm to 10 mm >10 mm to 50 mm >50 mm to 75 mm >75 mm to 100 mm	In-house Procedure MDCP -65 : 2020 EAL-G21 : 1996	0.05 μm 0.14 μm 0.15 μm 0.25 μm
52. Contour Measuring Machine (Lab / Site)	In-house Procedure MDCP -67: 2020	3 μm
53. Dial Depth Gauge	In-house Procedure MDCP -53: 2020	3 μm
54. Optical Flat and Parallel Diameter: 0 – 45mm	In-house Procedure MDCP-66 : 2020 JIS B 7430 : 1977 JIS B 7431 : 1977	0.1 μm
55. Glass Scale 0 – 100 mm 150mm	In-house Procedure MDCP--83: 2020	1.6 μm 1.9 μm

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55. Optical Flat and Parallel Diameter: 0 – 45mm	In-house Procedure MDCP-66 : 2020 JIS B 7430 : 1977 JIS B 7431 : 1977	0.1 µm
55. Glass Scale 0 – 100 mm 150mm	In-house Procedure MDCP--83: 2020	1.6µm 1.9µm
B. Mechanical		
1. Weighing Scale (Lab / Site) 0 – 400kg	In-house Procedure MDCP -20: 2020	0.0001 % of full scale
2. Hand Torque Tool 0.1 Nm to 1000 Nm	In-house Procedure MDCP -31: 2020 ISO 6789-1 : 2017 Clause 6 (Exclude Overloading Test and Endurance Test)	0.4 % of full scale
3. Torque Meter/Gauge (0-10 Nm)	In-house Procedure MDCP -30: 2020	0.06 % of full scale
4. Push/Pull Gauge	In-house Procedure MDCP -19: 2020	0.03 % of full scale
5. Hardness Tester Machine (Lab / Site) In-direct method only Rockwell A, B, C Vicker Brinell	In-house Procedure MDCP -48: 2020 JIS B 7726 : 2010 ASTM E 18 –16 JIS B 7725 : 2010 JIS B 7724 : 1999	0.7 HRA 0.6 HRB / HRC 1.8 Hv 1.8 Hb
6. Durometer Force Verification only	In-house Procedure MDCP -51 : 2020 ASTM D 2240 –15 ISO 868 : 2003 JIS K 6301 : 1995 JIS K 6253 : 2006	0.3 Deg

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7. Pressure / Vacuum Gauge (Lab / Site) -1 – 140 Bar 0 – 2700 Bar	In-house Procedure MDCP -52 : 2020 In-house Procedure MDCP -52a : 2020 (using deadweight tester) BS EN 837-1 to 3 : 1998	0.013 % of reading 0.018 % of reading
8. Tensile Testing Machine (Lab / Site) Up to 250 kN	In-house Procedure MDCP -61 : 2020 ISO 7500-1 : 2015	0.01 % of full scale
9. Load Cell (Lab / Site) Up to 250 kN	In-house Procedure MDCP -62 : 2020	0.01 % of full scale
10. Tension Gauge 0-150 kg	In-house Procedure MDCP -32 : 2020	0.01 %
11. Standard Weights 1mg – 10g 20g 50g – 200g 500g 1000g 2000g - 20000g	In-house Procedure MDCP -60 : 2020	0.00008g 0.00009g 0.0002g 0.001g 0.002g 0.2g
12. Tachometer (Lab / Site) RPM Meter 0 – 99999 rpm Non-Contact Type Contact Type	In-house Procedure MDCP -68 : 2020	1.7 rpm 0.6 rpm
13. Flowmeter (Lab/Site) 0 – 5 LPM 5 – 10 LPM	In-house Procedure MDCP-69: 2020	0.16 LPM 0.19 LPM

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<p>C. Temperature</p> <p>1. Thermocouple Indicator / Calibrator (measured / simulation)</p> <p>Type E (Lab) -250°C to -100 °C -100 °C to 1000 °C</p> <p>Type E (Site) -200 °C to 950°C</p> <p>Type J (Lab) -210 °C to 1200°C</p> <p>Type J (Site) -200 °C to 1200°C</p> <p>Type K (Lab) -200°C to 1372°C</p> <p>Type K (Site) -200°C to 1372°C</p> <p>Type N (Lab) -200°C to 1300°C</p> <p>Type N (Site) -200 °C to 1300°C</p> <p>Type R (Lab) 0°C to 1767 °C</p> <p>Type R (Site) -20°C to 1750°C</p> <p>Type S (Lab) 0°C to 1767°C</p> <p>Type S (Site) -20 °C to 1750°C</p> <p>Type T (Lab) -250°C to -150 °C -150 °C to 400°C</p> <p>Type T (Site) -200 °C to 400°C</p>	<p>In-house Procedure MDCPT-03 : 2020</p>	<p>0.5 °C 0.2 °C</p> <p>0.6 °C</p> <p>0.3 °C</p> <p>0.4 °C</p> <p>0.4 °C</p> <p>0.5 °C</p> <p>0.4 °C</p> <p>0.5 °C</p> <p>0.9 °C</p> <p>1.0 °C</p> <p>0.7 °C</p> <p>0.9 °C</p> <p>0.5 °C 0.3 °C</p> <p>0.6 °C</p>

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<p>2. RTD Indicator / Calibrator (measured / simulation)</p> <p>PT385 (100 Ω) (Lab)</p> <p>-200°C to 0°C</p> <p>0°C to 100°C</p> <p>100°C to 300°C</p> <p>300°C to 400°C</p> <p>400°C to 630°C</p> <p>630°C to 800°C</p> <p>PT385 (100 Ω) (Site)</p> <p>-200°C to 800°C</p> <p>PT3926 (100 Ω) (Lab)</p> <p>-200°C to 0°C</p> <p>0°C to 100°C</p> <p>100°C to 300°C</p> <p>300°C to 400°C</p> <p>400°C to 630°C</p> <p>PT3916 (100 Ω) (Lab)</p> <p>-200°C to -190°C</p> <p>-190°C to -80°C</p> <p>-80°C to 0°C</p> <p>0°C to 260°C</p> <p>260°C to 300°C</p> <p>300°C to 400°C</p> <p>400°C to 600°C</p> <p>600°C to 630°C</p>	<p>In-house Procedure MDCPT-04 : 2020</p>	<p>0.04 °C</p> <p>0.05 °C</p> <p>0.07 °C</p> <p>0.08 °C</p> <p>0.09 °C</p> <p>0.18 °C</p> <p>0.38 °C</p> <p>0.04 °C</p> <p>0.05 °C</p> <p>0.07 °C</p> <p>0.08 °C</p> <p>0.09 °C</p> <p>0.19 °C</p> <p>0.03 °C</p> <p>0.04 °C</p> <p>0.05 °C</p> <p>0.06 °C</p> <p>0.07 °C</p> <p>0.08 °C</p> <p>0.18 °C</p>
<p>2. RTD Indicator / Calibrator (measured / simulation)</p> <p>PT385 (200 Ω) (Lab)</p> <p>-200°C to 0°C</p> <p>0°C to 100°C</p> <p>100°C to 260°C</p> <p>260°C to 300°C</p> <p>300°C to 400°C</p> <p>400°C to 630°C</p>	<p>In-house Procedure MDCPT-04 : 2020</p>	<p>0.04 °C</p> <p>0.05 °C</p> <p>0.07 °C</p> <p>0.08 °C</p> <p>0.09 °C</p> <p>0.18 °C</p>

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PT385 (200 Ω) (Site) -200°C to 250°C 250°C to 630°C		0.23 °C 0.92 °C
PT385 (1000 Ω) (Lab) -200°C to 0°C 0°C to 100°C 100°C to 260°C 260°C to 300°C 300°C to 630°C		0.04 °C 0.05 °C 0.07 °C 0.08 °C 0.09 °C
PT385 (1000 Ω) (Site) -200°C to 630°C		0.16 °C
3. Enclosures C.1 Chamber / Oven / Freezers / System Accuracy Test Range : -70°C to 200 °C C.2 Furnace / System Accuracy Test Range : 200°C to 800 °C	In-house Procedure MDCPT-05 : 2020 and MDCPT-05a : 2020	2.1 °C 3.1°C
4. Thermometer with RTD Sensor / Probe Range : - 20°C to 150°C 150°C to 500°C 500°C to 650°C	In-house Procedure MDCPT-02 : 2020	1.1°C 1.3 °C 2.7 °C

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5. Thermohygrometer / Thermohygrograph Range : (18 to 70) °C (40 to 95) %relative humidity	In-house Procedure MDCPT-06: 2020	0.6 °C 3.5 %relative humidity
6. Surface Probe Range : 30°C to 300 °C	In-house Procedure MDCPT-07: 2020	2.0 °C
7. Dry Block Calibrator (Accuracy, Axial Homogeneity, Uniformity & Loading Effect) -20°C to 150 °C 150°C to 500°C	In-house procedure MDCPT-08a : 2020	0.64°C 0.86°C

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D. Electrical		
1. DC Voltage (Measure) 0 mV to 330 mV 0.33 V to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1000 V	Direct measurement with a DC voltage source	16 ppm + 2 μ V 9 ppm + 2 μ V 10 ppm + 17 μ V 14 ppm + 0.14 mV 14 ppm + 1.4 mV
2. DC Current (Measure) 0 μ A to 330 μ A 0.33 mA to 3.3 mA 3.3 mA to 33 mA 33 mA to 330 mA 0.33 A to 1.1 A 1.1 A to 3 A 3 A to 11 A 11 A to 20.5 A	Direct measurement with a DC current source	120 ppm + 0.02 μ A 78 ppm + 0.04 μ A 78 ppm + 0.20 μ A 78 ppm + 2.1 μ A 160 ppm + 0.04 mA 300 ppm + 0.05 mA 390 ppm + 0.70 mA 780 ppm + 0.59 mA
3. Resistance (Measure) 0 to 11 Ω 11 Ω to 33 Ω 33 Ω to 110 Ω 110 Ω to 330 Ω 0.33 k Ω to 1.1 k Ω 1.1 k Ω to 3.3 k Ω 3.3 k Ω to 11 k Ω 11 k Ω to 33 k Ω 33 k Ω to 110 k Ω 110 k Ω to 330 k Ω 0.33 M Ω to 1.1 M Ω 1.1 M Ω to 3.3 M Ω 3.3 M Ω to 11 M Ω	Direct measurement with a resistance source	32 ppm + 7.8 m Ω 24 ppm + 12 m Ω 22 ppm + 12 m Ω 22 ppm + 16 m Ω 22 ppm + 16 m Ω 22 ppm + 16 m Ω 22 ppm + 80 m Ω 22 ppm + 0.78 Ω 22 ppm + 0.80 m Ω 25 ppm + 8.1 Ω 25 ppm + 7.9 Ω 47 ppm + 0.17 k Ω 0.01% + 0.5 k Ω

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3. Resistance (Measure) 11 MΩ to 33 MΩ 33 MΩ to 110 MΩ 110 MΩ to 330 MΩ 330 MΩ to 1100 MΩ	Direct measurement with a resistance source	0.02% + 2.4 kΩ 390 ppm + 51 kΩ 0.24 % + 0.27 MΩ 1.2 % + 0.39 MΩ
4. AC Voltage (Measure) 1.0 mV to 33 mV 33 mV to 330 mV 0.33 V to 3.3 V 3.3 V to 33 V 33 V to 330 V	Direct measurement with a AC voltage source 10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 500 kHz 10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 500 kHz 10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 500 kHz 10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz	630 ppm + 7 μV 120 ppm + 5 μV 160 ppm + 5 μV 780 ppm + 5 μV 0.28 % + 10 μV 0.63 % + 40 μV 240 ppm + 7 μV 120 ppm + 7 μV 130 ppm + 7 μV 280 ppm + 7 μV 630 ppm + 25 μV 0.16 % + 55 μV 240 ppm + 0.04 mV 120 ppm + 0.05 mV 150 ppm + 0.05 mV 240 ppm + 0.04 mV 550 ppm + 0.10 mV 0.19 % + 0.50 mV 240 ppm + 0.6 mV 120 ppm + 0.5 mV 190 ppm + 0.5 mV 280 ppm + 0.5 mV 700 ppm + 1.3 mV 150 ppm + 1.6 mV 160 ppm + 4.9 mV 200 ppm + 4.9 mV 240 ppm + 4.8 mV 0.16 % + 39 mV

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4. AC Voltage (Measure)	Direct measurement with a AC voltage source	
330 V to 1000 V	45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz	240 ppm + 8.1 mV 200 ppm + 8.6 mV 240 ppm + 8.3 mV
5. AC Current (Measure)	Direct measurement with a AC current source	
29.00 µA to 330 µA	10 to 20 Hz 20 to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz 10 kHz to 30 kHz	0.16 % + 0.08 µA 0.12 % + 0.08 µA 0.10 % + 0.08 µA 0.23 % + 0.12 µA 0.62 % + 0.16 µA 1.2 % + 0.31 µA
0.33 mA to 3.3 mA	10 Hz to 20 Hz 20 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz 10 kHz to 30 kHz	0.16 % + 0.24 µA 0.10 % + 0.12 µA 0.08 % + 1.18 µA 0.16 % + 0.17 µA 0.39 % + 0.23 µA 0.78 % + 0.47 µA
3.3 mA to 33 mA	10 Hz to 20 Hz 20 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz 10 kHz to 30 kHz	0.14 % + 2.5 µA 0.07 % + 1.6 µA 0.03 % + 1.6 µA 0.07 % + 1.6 µA 0.16 % + 2.3 µA 0.31 % + 3.1 µA
33 mA to 330 mA	10 Hz to 20 Hz 20 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz 10 kHz to 30 kHz	0.14 % + 0.02 mA 0.07 % + 0.02 mA 0.03 % + 0.02 mA 0.08 % + 0.04 mA 0.16 % + 0.08 mA 0.31 % + 0.16 mA

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5. AC Current (Measure)	Direct measurement with a AC current source	
0.33 A to 3 A	10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz	0.14 % + 0.09 mA 0.05 % + 0.09 mA 0.47 % + 0.79 mA 2.0 % + 3.9 mA
3 A to 11 A	45 Hz to 100 Hz 100 Hz to 1 kHz 1 Hz to 5 kHz	0.05 % + 1.7 mA 0.08 % + 1.7 mA 2.4 % + 1.7 mA
11 A to 20.5 A	45 Hz to 100 Hz 0.1 kHz to 1 kHz 1 kHz to 5 kHz	0.10 % + 3.9 mA 0.12 % + 3.9 mA 2.4 % + 3.9 mA
6. Capacitance (Measure)	Direct measurement with a calibrator	
0.22 nF to 0.4 nF	10 Hz to 10 kHz	0.39 % + 0.0078 nF
0.4 nF to 1.1 nF	10 Hz to 10 kHz	0.39 % + 0.0079 nF
1.1 nF to 3.3 nF	10 Hz to 3 kHz	0.39 % + 0.0078 nF
3.3 nF to 11 nF	10 Hz to 1 kHz	0.20 % + 0.0097 nF
11 nF to 33 nF	10 Hz to 1 kHz	0.20 % + 0.097 nF
33 nF to 110 nF	10 Hz to 1 kHz	0.20 % + 0.097 nF
110 nF to 330nF	10 Hz to 1 kHz	0.20 % + 0.63 nF
0.33 µF to 1.1 µF	10 Hz to 600 Hz	0.20 % + 0.97 nF
1.1 µF to 3.3 µF	10 Hz to 300 Hz	0.20 % + 6.3 nF
3.3 µF to 11 µF	10 Hz to 150 Hz	0.20 % + 13 nF
11 µF to 33 µF	10 Hz to 120 Hz	0.32 % + 24 nF
33 µF to 110 µF	10 Hz to 80 Hz	0.35 % + 0.13µF
110 µF to 330 µF	0 to 50 Hz	0.35 % + 0.63 µF
0.33 mF to 1.1 mF	0 to 20 Hz	0.35 % + 1.1 µF
1.1 mF to 3.3 mF	0 to 6 Hz	0.35 % + 6.3 µF
3.3 mF to 11 mF	0 to 2 Hz	0.35 % + 13 µF
11 mF to 33 mF	0 to 0.6 Hz	0.59 % + 55 µF
33 mF to 110 mF	0 to 0.2 Hz	0.86 % + 78 µF

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION AND MEASUREMENT CAPABILITY (CMC*)
7. Frequency (Measure) 0.01 Hz to 99.99 Hz 100 Hz to 119.99 Hz 120 Hz to 1199.9 Hz 1.2 kHz to 11.99 kHz 12 kHz to 119.99 kHz 120 kHz to 1199.99 kHz 1.2 MHz to 2.0 MHz	Direct measurement with a calibrator	2.0 ppm + 8.6 μ Hz 2.0 ppm + 71 μ Hz 2.0 ppm + 0.49 mHz 2.0 ppm + 7.6 mHz 2.0 ppm + 71 mHz 2.0 ppm + 0.76 Hz 2.0 ppm + 0.99 Hz
10Hz 10 Hz to 100 Hz >100 Hz to 1 kHz >1 kHz to 10 kHz >10 kHz to 100 kHz >100 kHz to 1 MHz >1 MHz to 10 MHz >10 MHz to 100 MHz >100 MHz to 1000 MHz 1 GHz to 18.5 GHz	Direct measurement with a SIGNAL SOURCE UUT: 628A Master: 8672 + GPS Standard	0.0036 ppm + 5.7 μ Hz 0.0036 ppm + 8.8 μ Hz 0.0036 ppm + 79 μ Hz 0.0036 ppm + 75 μ Hz 0.0036 ppm + 0.18 mHz 0.0029 ppm + 0.12 mHz 0.0027 ppm + 0.8 Hz 0.0025 ppm + 0.7 Hz 0.0026 ppm + 0.8 Hz 0.0036 ppm + 5.1 Hz
8. Stopwatch/ Timer 30 s – 1 hour	Direct measurement with a calibrated stopwatch	0.3 seconds
9. Clamp Meter 0 A – 16.5 A 16.5 A – 55 A 55 A – 150 A 150 A – 550 A 550 A – 1000 A	Direct measurement with a calibrator DC DC DC DC DC	0.01 % +58 mA 0.02 % + 0.2 A 0.03 % + 0.2 A 0.04 % + 0.2 A 0.08 % + 0.2 A
10 A – 16.5 A 10 A – 16.5 A 10 A – 16.5 A	45 Hz – 65 Hz 65 Hz – 100 Hz 100 Hz – 440 Hz	0.33 % + 58 mA 0.92 % + 58 mA 0.93 % + 58 mA

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION AND MEASUREMENT CAPABILITY (CMC*)
16.5 A – 150 A	45 Hz – 65 Hz	0.34 % + 65 mA
16.5 A – 150 A	65 Hz – 100 Hz	0.92 % + 66 mA
16.5 A – 150 A	100 Hz – 440 Hz	0.94 % + 66 mA
150 A – 1000 A	45 Hz – 65 Hz	0.34 % + 0.12 A
150 A – 1000 A	65 Hz – 100 Hz	0.92 % + 0.13 A
150 A – 1000 A	100 Hz – 440 Hz	1.2 % + 0.13 A

* CMC is expressed as an expanded uncertainty estimated at a level of confidence of approximately 95%.

NOTE : Direct conversion of the metric units to imperial units will be applied for imperial measurement

Approved Signatories :

Mr John Peh	Item A & B
Ms Peh Woon Teng	- Item A(1-16, 19-21, 24-27, 29-46, 48-51, 53-55), Item C, Item D
Ms Lee Siew Moy	- Item A (1-12, 16, 19-21, 26-27,29, 31-32, 34-36,38, 41, 53)
Mr Kendrew Peh	- Item B(1,2, 5 & 11)
Mr Weerasak Jokthong	- Item A, Item B (except B12), Item C, Item D
Mr Apichai Thepmaneerat	- Item A(4, 12-16, 18, 24-25, 28, 34, 45-47, 49, 52)
Mr Koo Chih Wei	- Item A (1,2,12,16,19,22,27-30,33-35,37,42,44-46,48,51,54), Item B (1-4, 6-11, 13)
Mr David Yap	- Items A (12-16, 24)

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid calibrations. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.