SINGAPORE LABORATORY
ACCREDITATION SCHEME

ACCREDITED LABORATORY
SAC-SINGLAS

Schedule

BS Tech Pte Ltd
No. 41 Senoko Drive
Singapore 758249

Certificate No. : LA-2006-0358-C

Issue No. : 9

Date : 18 October 2013

FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD / FREQUENCY	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)
A.Electrical (Lab & Site)		
1. Calibration of Resistance Measuring Instruments (2 Wire)	Technical Procedure Section BSE-01	
0-10.9999 Ω		0.012 Ω
11 Ω-32.9999 Ω		0.016 Ω
33 Ω-109.9999 Ω		0.022 Ω
110 Ω-329.9999 Ω		0.027 Ω
0.330 kΩ-1.099999 kΩ		0.000044 kΩ
1.1 kΩ-3.299999 kΩ		0.00027 kΩ
3.3 kΩ-10.99999 kΩ		0.00044 kΩ
11 kΩ-32.99999 kΩ		0.0019 kΩ
33 kΩ-109.9999 kΩ		0.0036 kΩ
110 kΩ-329.9999 kΩ		0.020 kΩ
330kΩ-1.0999999 MΩ		0.000041 MΩ
1.1 MΩ-3.299999 MΩ		0.0034 MΩ
3.3 MΩ-10.99999 MΩ		0.0014 MΩ
11 MΩ-32.99999 MΩ		0.015 MΩ
33 MΩ-109.9999 MΩ		0.060 MΩ
110 MΩ-329.9999 MΩ		1.6 MΩ
330 MΩ-1100 MΩ		14 MΩ

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2. Calibration of Resistance Measuring Instruments (4 wire)	Technical Procedure Section BSE-01	
0 to 10.9999 Ω		0.012 Ω
11 Ω to 32.9999 Ω		0.016 Ω
33 Ω to 109.9999 Ω		0.018 Ω
110 Ω to 329.9999 Ω		0.027 Ω
330 Ω to 1.099999 kΩ		0.000044 kΩ
1.1 kΩ to 3.299999 kΩ		0.00027 kΩ
3.3 kΩ to 10.99999 kΩ		0.00044 kΩ
11 kΩ to 32.99999 kΩ		0.0019 kΩ
33 kΩ to 109.9999 kΩ		0.0036 kΩ
3. Calibration of Resistance Measuring Instruments Wire (2 or 4 Wire)	Technical Procedure Section BSE-02	
0.1 Ω to 1 Ω		0.0024 Ω
1.1 Ω to 10 Ω		0.0035 Ω
10.1 Ω to 100 Ω		0.0088 Ω
100.1 Ω to 1 kΩ		0.012 kΩ
1.1 kΩ to 10 kΩ		0.12 kΩ
10.1 kΩ to 100 kΩ		1.2 kΩ
100.1 kΩ to 1 MΩ		0.012 MΩ
1.1 MΩ to 10 MΩ		0.012 MΩ
10.1 MΩ to 100 MΩ		1.2 MΩ
4. Calibration of Milliohm meters	Technical Procedure Section BSE-02	
10 mΩ		1.2 mΩ
30 mΩ		3.5 mΩ
50 mΩ		5.8 mΩ
100 mΩ		12 mΩ
330 mΩ		38 mΩ
470 mΩ		54 mΩ

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5. High Voltage Resistance Measuring Instruments	Technical Procedure Section BSE-03	
10 MΩ		0.58 MΩ
50 MΩ		2.9 MΩ
100 MΩ		5.8 MΩ
200 MΩ		12 MΩ
1 GΩ		0.015 GΩ
2 GΩ		0.12 GΩ
5 GΩ		0.29 GΩ
6. Calibration of DC Voltage Measuring Instruments	Technical Procedure Section BSE-04	
0 to 329.9999 mV		0.0061 mV
0.330 V to 3.299999 V		0.000055 V
3.30 V to 32.99999 V		0.00036 V
33 V to 329.9999 V		0.0061 V
330 V to 1000.000 V		0.019 V
7. Calibration of DC Voltage Sourcing instruments	Technical Procedure Section BSE-13	
0 to 100 mV		0.0076 mV
0.101 V to 1 V		0.000047 V
1.1 V to 10 V		0.0041 V
10.1 V to 100 V		0.0053 V
100.1 V to 1000 V		0.0054 V
1 kV to 10 kV		0.23 kV
10.1 kV to 20 kV		0.47 kV
20.1 kV to 30 kV		0.36 kV
30.1 kV to 40 kV		0.93 kV

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8. Calibration of AC Voltage Measuring Instruments	Technical Procedure Section BSE-05	
1.0 mV to 32.999 mV	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 450 kHz	0.023 mV 0.0087 mV 0.0098 mV 0.028 mV 0.091 mV 0.23 mV
33 mV to 329.999 mV	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 450 kHz	0.084 mV 0.044 mV 0.048 mV 0.084 mV 0.23 mV 0.57 mV
0.330 V to 3.2999 V	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 450 kHz	0.00081 V 0.00043 V 0.00054 V 0.00081 V 0.0019 V 0.0067 V
3.3 V to 32.9999 V	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 50 kHz 50 kHz to 90 kHz	0.0082 V 0.0044 V 0.0066 V 0.024 V
33 V to 329.999 V	45 Hz to 1 kHz 1 kHz to 10 kHz	0.027 V 0.057 V
33 V to 200 V	10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 90 kHz	0.074 V 0.086 V 0.35 V
330 V to 750 V	45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 8kHz	0.18 V 0.12 V 0.18 V

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9. Calibration of AC Voltage Sourcing Instruments	Technical Procedure Section BSE-14	
1 mV to 100 mV	10 Hz to 1 kHz 1 kHz to 50 kHz	0.086 mV 0.15 mV
0.101 V to 1 V	10 Hz to 1 kHz 1 kHz to 50 kHz 1 kHz to 100 kHz	0.00068 V 0.00085 V 0.0070 V
1.1 V to 10 V	10 Hz to 1 kHz 1 kHz to 50 kHz	0.0068 V 0.015 V
10.1 V to 100 V	10 Hz to 1 kHz 1 kHz to 50 kHz	0.068 V 0.15 V
100.1 V to 700 V	10 Hz to 1 kHz 1 kHz to 20 kHz 20 kHz to 50 kHz	0.49 V 0.66 V 1.1 V
0.701 kV to 10 kV 10.1 kV to 20 kV 20.1 kV to 28 kV	60 Hz 60 Hz 60 Hz	0.61 kV 1.2 kV 1.7 kV
10. Calibration of DC Current Measuring Instruments	Technical Procedure Section BSE-06	
1 µA to 329.999 µA 0.330 mA to 3.29999 mA 3.30 mA to 32.9999 mA 33 mA to 329.999 mA 0.330 A to 1.0 A 1.01 A to 2.0 A 2.01 A to 10.0 A 10.01 A to 20.5 A		0.054 µA 0.00030 mA 0.0028 mA 0.028 mA 0.00020 A 0.0012 A 0.0047 A 0.019 A

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11. Calibration of DC Current Clamp Meters	Technical Procedure Section BSE-07	
0 to 10 A		0.1 A
10.1 A to 50 A		0.38 A
50.1 A to 100 A		0.54 A
100.1 A to 500 A		2.5 A
501 A to 1000 A		4.7 A
12. Calibration of DC Current Sourcing Instruments	Technical Procedure Section BSE-15	
10 µA to 100 µA		0.42 µA
0.101 mA to 1 mA		0.0024 mA
1.1 mA to 10 mA		0.0062 mA
10.1 mA to 100 mA		0.058 mA
0.101 A to 1.0 A		0.097 A
1.01 A to 2 A		0.0029 A
13. Calibration of AC Current Measuring instruments	Technical Procedure Section BSE-08	
29 µA to 329.999 µA	10 Hz to 45 Hz	0.46 µA
	45 Hz to 1 kHz	0.40 µA
	1 kHz to 30 kHz	4.4 µA
0.330 mA to 3.2999 mA	10 Hz to 45 Hz	0.0033 mA
	45 Hz to 1 kHz	0.0015 mA
	1 kHz to 30 kHz	0.026 mA
3.3 mA to 32.999 mA	10 Hz to 45 Hz	0.025 mA
	45 Hz to 1 kHz	0.012 mA
	1 kHz to 30 kHz	0.11 mA
33 mA to 329.99 mA	10 Hz to 45 Hz	0.25 mA
	45 Hz to 1 kHz	0.13 mA
	1 kHz to 30 kHz	1.2 mA
0.330 A to 1.0 A	10 Hz to 45 Hz	0.0015 A
	45 Hz to1 kHz	0.00052 A
	1 kHz to 10 kHz	0.023 A

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1.01 A to 2.0 A	10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 10 kHz	0.0023 A 0.0013 A 0.043 A
2.01 A to 10.0 A	45 Hz to1 kHz 1 kHz to 5 kHz	0.0013 A 0.0013 A
10.1 A to 20.5 A	45 Hz to 1 kHz 1 kHz to 5 kHz	0.032 A 0.47 A
14. Calibration of AC Current Clamp meters	Technical Procedure Section BSE-08	
0.1 A to 5A 5.1 A to 10 A 10.1 A to 50 A 50.1 A to 100 A 100.1 A to 500 A 500.1 A to 1000 A	30 Hz to 50 Hz	0.073 A 0.1 A 0.38 A 0.54 A 2.5 A 4.7 A
15. Calibration of AC Current Sourcing Instruments	Technical Procedure Section BSE-16	
10 mA to 100 mA 0.101 A to 1 A 1.01 A to 2 A	10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz	0.35 mA 0.0013 A 0.0041A
16. Calibration of Frequency Measuring Instruments	Technical Procedure Section BSE-09	
0.01 Hz to 1.199 kHz 1.200 kHz to 100 kHz 100.1 kHz to 2.000 MHz		0.00029 Hz 0.00025 kHz 0.000004 MHz

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17. Calibration of Capacitance Measuring Instruments	Technical Procedure Section BSE-10	
0.19 nF to 0.3999 nF	1 kHz	0.0094 nF
0.4 nF to 1.0999 nF	1 kHz	0.012 nF
1.1 nF to 10.9999 nF	1 kHz	0.032 nF
11 nF to 32.9999 nF	1 kHz	0.15 nF
33 nF to 109.999 nF	1 kHz	0.31 nF
110 nF to 329.999 nF	1 kHz	0.89 nF
0.33 µF to 1.09999 µF	100 Hz	0.0030 µF
1.1µF to 3.29999 µF	100 Hz	0.0094 µF
3.3 µF to 10.9999 µF	100 Hz	0.031 µF
11µF to 32.9999 µF	100 Hz	0.13 µF
33 µF to 109.9999 µF	50 Hz	0.47 µF
110 µF to 329.999 µf	50 Hz	1.4 µF
0.33 mF to 1.09999 mF	50 Hz	0.0047 mF
1.1 mF to 3.2999 mF	20 Hz	0.014 mF
18. Calibration of Inductance Measuring Instruments	Technical Procedure Section BSE-11	
1 mH	1kHz	0.012 mH
10 mH		0.066 mH
20 mH		0.12 mH
30 mH		0.18 mH
50 mH		0.31 mH
100 mH		0.61 mH
1 H		0.0062 H
10 H		0.069 H
19. Calibration of Electrical Power meter Instruments	Technical Procedure Section BSE-17	
0.1 W to 1000 W	40 Hz to 60 Hz	0.0081 W
1.1 kW to 2 kW		0.0018 kW
2.1 kW to 14 kW		0.0087 kW
20. Calibration of Digital Timer, Analog Timer, Stop Watch	Technical Procedure Section BSE-12	
600 s to 1800 s		0.61 s
1801 s to 3600 s		0.85 s

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B. Mechanical (Lab & Site)		
1. Absolute Pressure Instruments Type of Instruments: Absolute Gauge Absolute Recorder Absolute Calibrator Digital Indicator Transmitters Transducers Barometer Manometer Range: 0 to 1600 mbar abs	Technical Procedure Section BSM-06	7.3 mbar
2. Non-Oil/Oxygen Pressure Instruments Range : 0.000 to 2.000 ”H_2O -1000 mbar to 30 psi 0 to 1000 psi 10 psi to 10000 psi	Technical Procedure Section BSM-01 BSM-02 BSM-03,& BSM-04	0.009 ”H_2O 0.14% 0.6 psi 9.3 psi
3. Pneumatic Instruments Type of Instruments : Pneumatic Gauge Calibrators Digital Indicators Data Logger Manometers Transducer Chart Recorders Magnehelic gauge Range : 0.000 to 2.000 ”H_2O -1000 mbar to 30 psi 0 to 1000 psi	Technical Procedure Section BSM-02 BSM-03 & BSM-04	0.009 ”H_2O 0.14% 0.6 psi

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4. Vacuum Instruments Type of Instruments : Digital Indicator Torr Meter Vacuum Gauges Digital Indicator Manometer Calibrators Magnehelic Gauge and High Vacuum Sensors Range : 10 to 1 Torr 1 Torr to 1E to 4 Torr 1E-4 Torr to 1E-5 Torr 1E-5 Torr to 1E-6 Torr	Technical Procedure Section BSM-06	 5.3 % 27 % 25 % 29 %
5. Hydraulic Pressure Instruments Type of Instruments : Oil Pressure Gauge, Distilled Water Pressure Gauge, Calibrator, Digital Indicator, Manometers, Controller, Data Logger, Chart Recorder, Pressure Switches, Pressure transducer and Transmitters Range : 0 to 16 000 psi 0 to 2500 bar	Technical Procedure Section BSM-01	 0.022 % of Reading 6.4 bar

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6. Dead Weight Testers Type of Instruments : Hydraulic Oil Dead Weight Tester (Cross Float) Range : 0 to 16000 psi	Technical Procedure Section BSM-01	0.022 % of Reading
7. Differential Pressure Type of Instruments : Pneumatic Differential Gauge Switches Pneumatic Differential Indicators and Magnehelic Gauge Manometers Flowmeters Anemometer Velometer Balometer Range : 0 to 2 ”H_2O	Technical Procedure Section BSM-04	0.009 ”H_2O
8. Force Gauge Instruments Range : 0 to 1000 psi 0 to 16000 psi	Technical Procedure Section BSM-01 & BSM-02	0.6 psi 0.022 % of reading

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9. Pressure Relief Valve Instruments Range : Gas Up to 70 bar	Technical Procedure Section BSM-09	 0.53 % of F.S
10. Non Contact & Contact Tachometer Instruments Non Contact Tachometer Range : 10 to 99 999 rpm Contact Tachometer Range : 0 to 4800 rpm	Technical Procedure Section BSM-08	 3.6 rpm 2.5 rpm
11. Calibration of Balances and Weighing Scale Type of Instruments : Weighing Scales Compact Scales Industrial Balances Electronics Balances Environmental Balances Dust & Waterproof Digital Scales Electronics Pocket Balances Moisture Balance Top Loading Balances Bench / Counting Scale Floor Scale Platform Scale	Technical Procedure Section BSM-07	

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1 mg to 20 mg		0.14 mg
20 mg to 50 mg		0.14 mg
50 mg to 100 mg		0.14 mg
100 mg to 200 mg		0.14 mg
200 mg to 500 mg		0.14 mg
500 mg to 500 g		0.4 mg
500 g to 5000 g		3 mg
5000 g to 10000 g		20 mg
10000 g to 24000 g		100 mg
24 kg to 60 kg		0.011 kg
60 kg to 200 kg		0.02 kg
200 kg to 300 kg		0.05 kg
300 kg to 500 kg		0.13 kg
500 kg to 600 kg		0.2 kg
12. Calibration of Standard Weights Test Weights Precision Weights	Technical Procedure Section BSM-12	
OIML Class M3 Weights or equivalent		
1 g to 50 g		0.0002 g
50 g to 200 g		0.0002 g
200 g to 500 g		0.012 g
500 g to 1 kg		0.012 kg
1 kg to 2 kg		0.012 kg
2 kg to 5 kg		0.012 kg
5 kg to 10 kg		0.058 kg
10 kg to 20 kg		0.12 kg
OIML Class M2 Weights or equivalent		
1 kg to 5 kg		0.0058 kg
5 kg to 10 kg		0.029 kg
10 kg to 20 kg		0.058 kg

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OIML Class M1 Weights or equivalent		
2 kg to 5 kg		0.012 kg
2 kg to 10 kg		0.029 kg
10 kg to 20 kg		0.058 kg
13. Torque Measuring Instruments	Technical Procedure Section BSM-10	
Type of Instruments : Torque Hand Tools Round dial gauge Torque Screwdriver Torque Gauge (Digital / Analog) Dial Indicating Type Torque Wrench Indicator Plate Torque Wrench Adjustable Torque Wrench Rotating Torque Screw Driver Preset Torque Wrench Data Printout Digital Torque Wrench Hydraulic Torque Gauge		
Range :		
0 to 1.6 N.m		0.08 N.m
1.6 to 10 N.m		0.32 N.m
10 to 100 N.m		0.89 N.m
100 to 500 N.m		6.5 N.m
500 to 1000 N.m		13.0 N.m
1000 to 1500 N.m		15.0N.m
1500 to 2000 N.m		16.0 N.m
2000 to 2500 N.m		27.0 N.m
2500 to 2700 N.m		28.0 N.m

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14. Torque Meter Tester	Technical Procedure Section BSM-11	
Type of Instruments : Torque Checker Torque Meter Tester Torque Analyzer		
Range :		
Up to 100 kgf.cm		0.15 kgf.cm
15. Force Measuring Instruments	Technical Procedure Section BSM-13	
Type of Instruments : Push Pull Gauge Force Gauge Load Cell Tension Meter Gram Gauge Manual Test Stands Motorized Test Stands Dial Tension Gauge Tension Gauge Wire Tension Meter Load Gauge Spring Balance Tensile Tester Cable Tension Meter Force Indicator Dynamometer Belt Tension Gauge Strap Tension Meter		
Range :		
1 gf to 100 gf		0.005 kgf.cm
100 gf to 1kgf		0.04 kgf.cm
1 kgf to 100 kgf		0.04 kgf.cm
100 kgf to 400 kgf		0.25 kgf.cm
400 kgf to 600 kgf		0.37 kgf.cm

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16. Rubber Hardness Tester	Technical Procedure Section BSM-14	
Type of Instruments Hand Durometer Digital Durometer Pencil Durometer Multi Scale Durometer Dial Durometer Tire Hardness Durometer Pocket Durometer	Type A, B, C, D	
Range : Up to 100 Div Durometer Type A, B, C		0.3 Div
C. Temperature (Lab & Site)		
1. Temperature Measuring Instruments	Technical Procedure Section BST 01-H BST 01-L	
a. Glass Thermometer (Lab) Range: Scale Div - 75 ~ -30 °C 0.1 ˚C - 30 ~ 30 °C 0.1 ˚C 30 ~ 100 °C 0.1 ˚C 100 ~ 300 °C 0.1 ˚C		0.20 ˚ C 0.17 ˚ C 0.10 ˚ C 0.10 ˚ C
b. RTD Sensor/ Thermister Probe without indicator Range : - 75 ~ -20 °C - 20 ~ 30 °C 30 ~ 100 °C 100 ~ 300 °C 300 ~ 500 °C	Technical Procedure Section BST 01-H, BST 01-L	Lab / Site 0.19 °C / - 0.16 °C / 0.22 °C 0.06 °C / 0.22 °C 0.07 °C / 0.83 °C 0.22 °C / 0.83 °C

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c. RTD Sensor/ Thermister Probe with Indicator Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 300 °C 300 ~ 500 °C		Lab / Site 0.2 °C / - 0.2 °C / 0.2 °C 0.1 °C / 0.2 °C 0.1 °C / 0.8 °C 0.2 °C / 0.8 °C
d. Digital Thermometer with sensor, Temperature Switch, Temperature Transmitter, Temperature Transducer, Data Logger with Sensor, Temperature Controller with Sensor Temperature Indicator with Sensor Sensor, Temperature Recorder with Sensor Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 300 °C 300 ~ 500 °C 500 ~ 1000 °C		Lab / Site 0.20 °C / - 0.17 °C / 0.23 °C 0.09 °C / 0.23 °C 0.19 °C / 0.84 °C 0.23 °C / 0.83 °C 1.5 °C / 1.5 °C
e. Thermocouple without Indicator Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 300 °C 300 ~ 500 °C 500 ~ 1000 °C	Technical Procedure Section BST 01-H,BST 01-L & BST-02	Lab / Site 0.27 °C / - 0.27 °C / 0.32 °C 0.21 °C / 0.30 °C 0.53 °C / 1.0 °C 0.61 °C / 1.0 °C 1.6 °C / 1.6 °C

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f. Thermocouple with Indicator		Lab / Site
Range :		
-75 ~ -20 °C		0.22 ° C / -
-20 ~ 30 °C		0.22 ° C / 0.28 °C
30 ~ 100 °C		0.13 ° C / 0.25 °C
100 ~ 300 °C		0.15 ° C / 1.0 °C
300 ~ 500 °C		0.32 ° C / 1.0 °C
500 ~ 1000°C		1.6 ° C / 1.6 °C
2. Dry Block Calibrator (Lab/Site)	Technical Procedure Section BST 01-H,BST 01-L & BST-02	
Range :		
-40 ~ 650 °C		1.2 °C
3. Ice Point	Technical Procedure Section BST 04	
Range :		
0 ˚ C		0.054 ˚ C
4. (a) Calibration of Temperature Indicator (Lab/Site)	Technical Procedure Section BST 05	
Type J :		
-210 ~ 150 °C		0.35 °C
150 ~ 1200 °C		0.31 °C
Type K :		
-200 ~ 200 °C		0.52 °C
200 ~ 1300 °C		0.57 °C
Type T :		
-250 ~ -150 °C		0.78 °C
-150 ~ 400 °C		0.32 °C
Type R :		
0 ~ 250 °C		0.91 °C
250 ~ 500 °C		0.75 °C
500 ~ 1750 °C		0.77 °C

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Type S :		
0 ~ 1200 °C		0.83 °C
1200 ~ 1750 °C		0.80 °C
Type B :		
600 ~ 1000 °C		0.83 °C
1000 ~ 1800 °C		0.70 °C
Type N :		
- 200 ~ 50 °C		0.96 °C
50 ~ 1300 °C		0.90 °C
Type E :		
-100 ~ 1000 °C		0.35 °C
4. (b) Calibration of Thermocouple Sourcing Instrument(Lab/Site)	Technical Procedure Section BST 05	
Type J :		
-210 ~ 150 °C		0.36 °C
150 ~ 1200 °C		0.32 °C
Type K :		
-200 ~ 200 °C		0.53 °C
200 ~ 1300 °C		0.57 °C
Type T :		
-250 ~ -150 °C		0.80 °C
-150 ~ 400 °C		0.33 °C
Type R :		
0 ~ 250 °C		0.92 °C
250 ~ 500 °C		0.79 °C
500 ~ 1750 °C		0.77 °C
Type S :		
0 ~ 1200 °C		0.89 °C
1200 ~ 1750 °C		0.81 °C
Type B :		
600 ~ 1000 °C		0.87 °C
1000 ~ 1800 °C		0.70 °C

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Type N : -200 ~ 260 °C 260 ~ 1300 °C Type E : -100 ~ 1000 °C		 0.98 °C 0.90 °C 0.36 °C
5. (a) PRT Electrical Simulation Instruments (Lab/Site) Range : Type PT 100 (385) -100 ~ 800 °C (b) PRT Sourcing Instruments (Lab/Site) Range : Type PT 100 (385) -100 ~ 800 °C	Technical Procedure Section BST 05	 0.27 °C 0.20 °C
6. Controlled Temperature Enclosure (Lab/Site) a. Freezers Oven & Furnaces Range : -75 ~ 250 °C 250 ~ 500 °C 500 ~ 800 °C 800 ~ 1000 °C b. Autoclaves	Technical Procedure Section BST 06	 2.5 ˚ C 2.8 ˚ C 3.9 ˚ C 4.2 ˚ C 1.4 ° C
7. Humidity Chamber(Lab/Site) Humidity Range : 10 ~ 95 % rh.(5~50 °C) Temperature Range : 5 ~ 50 °C (10 ~ 95 %) rh.	Technical Procedure Section BST 06	 2.9 %rh. 1.4 °C

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)
8. Calibration of Surface Probes with/without Indicator (Lab/Site)	Technical Procedure Section BST 08	
Range : 50 ~ 250 °C 250 ~ 450 °C		 3.0 °C 5.5 °C
9. Humidity / Temperature /Dew Point Measuring Temperature Instruments (Lab/Site)		
Humidity : 10 ~ 95 %rh (5 ~ 50 °C)		 3.0 % rh
Temperature : 5 ~ 23 °C (10 ~ 95 %rh) 23 ~ 50 °C (10 ~ 95 %rh)		 0.5 °C 0.5 °C
D.Dimensional (Lab & Site)		
1. Micrometer Measuring Instruments a. External Micrometer b. Interchangeable Micrometer c. Digimatic Micrometer d. Outside Micrometer e. Caliper Type Micrometer f. Screw Thread Micrometer g. Gear tooth Micrometer h. Disk Micrometer i. Sheet Metal Micrometer j. Spline Micrometer k. Quick-Mini l. Tube Micrometer m. Point Micrometer n. V-Anvil Micrometer o. Blade Micrometer p. Groove Micrometer q. Can Seam Micrometer	Technical Procedure Section BSD-01	

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)	
r. Digit outside Micrometer s. Digimatic Bench Micrometer t. Dial Snap Meter u. Indicating Micrometer			
Range:		Lab	On-site
Flatness		1 µm	2 µm
Parallelism:		Lab	On-site
0 mm to 500 mm		2 µm	3 µm
501 mm to 1000 mm		2 µm	3 µm
1001 mm to 1500 mm		3 µm	3 µm
Accuracy:		Lab	On-site
0 mm to 500 mm		1 µm	2 µm
501 mm to 1000 mm		2 µm	2 µm
1001 mm to 1500 mm		3 µm	3 µm
2. End Rod measurements	Technical Procedure Section BSD-02		
Standard Rod / Extension road			
Range:		Lab	On-site
0 mm to 500 mm		2 µm	3 µm
501 mm to 1000 mm		3 µm	4 µm
1001 mm to 1500 mm		3 µm	4 µm
3. Caliper Measuring Instruments	Technical Procedure Section BSD-03		
a. Super Caliper b. Solar Caliper c. Coolant Proof Caliper d. Digimatic Caliper e. Vernier Caliper f. Dial Caliper g. Carbon Fiber Caliper h. Long jaw Caliper i. Back-jaw Caliper j. Blade type Caliper			

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)
k. Tube thickness Caliper l. Neck Caliper m. Hook type Vernier Caliper n. Low force Caliper		
Range: Resolution: 0 mm to 500 mm 10 µm 20 µm 50 µm		Lab / On-site 10 µm / 10 µm 20 µm / 20 µm 50 µm / 50 µm
Range: Resolution: 0 mm to 1000 mm 10 µm 20 µm 50 µm		Lab / On-site 10 µm / 10 µm 20 µm / 20 µm 50 µm / 50 µm
Range: Resolution: 0 mm to 1500 mm 10 µm 20 µm 50 µm		Lab / On-site 10 µm / 10 µm 20 µm / 20 µm 50 µm / 50 µm
4. Height Measuring Instruments a. Vernier Height Gauge b. Digimatic Height Gauge c. Height Gauge	Technical Procedure Section BSD-04	
Flatness :		Lab / On-site 2 µm / 3 µm
Parallelism: 0 mm to 500 mm 501 mm to 1000 mm 1001 mm to 1500 mm		Lab / On-site 2 µm / 3 µm 2 µm / 3 µm 3 µm / 3 µm
Accuracy :		
Range: Resolution: 0 mm to 500 mm 10 µm 20 µm 50 µm		Lab / On-site 10 µm / 10 µm 20 µm / 20 µm 50 µm / 50 µm

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0 mm to 1000 mm 10 µm 20 µm 50 µm 0 mm to 1500 mm 10 µm 20 µm 50 µm		10 µm 10 µm 20 µm 20 µm 50 µm 50 µm 10 µm 10 µm 20 µm 20 µm 50 µm 50 µm
5. Depth Measuring Instruments a. Vernier Depth Gage b. Digimatic Depth Gage c. Dial Depth Gage d. Depth Gage e. Tire Thread Depth Gage f. Pitch Depth Gage g. Thread Depth Gage	Technical Procedure Section BSD-05	
Range: Resolution: 0 mm to 500 mm 10 µm 20 µm 50 µm Range: Resolution: 0 mm to 1000 mm 10 µm 20 µm 50 µm		Lab On-site 10 µm 10 µm 20 µm 20 µm 50 µm 50 µm Lab On-site 10 µm 10 µm 20 µm 20 µm 50 µm 50 µm
6. Internal Measuring Instruments a. Stick Micrometers b. Digimatic Tubular Micrometers c. Tubular Micrometers d. Inside Micrometer	Technical Procedure Section BSD-06	

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Accuracy:		
Range : 0 mm to 1500 mm		Lab: 3 µm On-site: 4 µm
Extension Rods:		
Range: 0 mm to 500 mm 501 mm to 1500 mm		Lab: 2 µm On-site: 3 µm Lab: 3 µm On-site: 4 µm
7. Depth Micrometers	Technical Procedure Section BSD-07	
Flatness :		Lab: 2 µm On-site: 3 µm
Parallelism: 0 mm to 300 mm		Lab: 2 µm On-site: 3 µm
Accuracy: 0 mm to 300 mm		Lab: 1 µm On-site: 2 µm
Extension Rods: 0 mm to 300 mm		Lab: 2 µm On-site: 3 µm
8. Plunger Indicating Instruments a. Dial indicator b. Digimatic indicator c. Hicator d. Signal Hicator e. Back plunger dial indicator f. Deflection Gauge g. Special Dial Indicator h. Micro Indicator	Technical Procedure Section BSD-08	
Range: Resolution: 0 mm to 100 mm 1 µm 5 µm 10 µm		Lab / On-site: 1 µm: Lab 1 µm, On-site 2 µm 5 µm: Lab 5 µm, On-site 5 µm 10 µm: Lab 10 µm, On-site 10 µm

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9. Lever Indicating Instruments a. Dial test Indicator b. Pocket type dial test indicator	Technical Procedure Section BSD -09	
Accuracy: 0 mm to 5 mm		Lab: 1 µm On-site: 2 µm
10. Limit Gauges	Technical Procedure Section BSD-10 & BSD-11	
a. Plain Plug & Pin Gauges Range: 0 mm to 100 mm 101 mm to 300 mm		Lab / On-site: 1 µm / 2 µm 2 µm / 3 µm
b. Plain Ring Gauges Range: 0 mm to 100 mm 101 mm to 300 mm		Lab / On-site: 1 µm / 2 µm 2 µm / 3 µm
c. Plain Gap Gauges Range: 0 mm to 100 mm 101 mm to 300 mm		Lab / On-site: 1 µm / 2 µm 2 µm / 3 µm
d. Other limit Gauges(Including Height, Depth & Length) Range: 0 mm to 100 mm 101 mm to 300 mm		Lab / On-site: 1 µm / 2 µm 2 µm / 3 µm
e. Precision Balls Range: 0 mm to 100 mm		Lab / On-site: 1 µm / 2 µm

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)
11. Line Standard 11.1 Tapes: a. Measuring Tape b. Carpenter Tape c. MMC tape d. Tank Gauging Tape e. Hook Tape f. Circumferential Tape g. PI Tape h. Surveyor Tape Range: 0 m to 50 m	Technical Procedure Section BSD-16	Lab: 1 mm On-site: 1.2 mm
11.2 Steel Ruler Range: 0 m to 2000 m	Technical Procedure Section BSD-17	Lab: 0.06mm On-site: 0.10 mm
11.3 Scales: a. Coolant proof Digimatic Scale Units b. Linear Scale c. Glass Scale d. Stage micrometer Scale e. Objective Scale f. Microscope Scale g. Standard Scale Range: 0 mm to 300 mm	Technical Procedure Section BSD-18	Lab: 1 µm On-site: 2 µm
12. Protractor Standard a. Digimatic Protractor b. Dial protractor c. Vernier Protractor d. Bevel Protractor	Technical Procedure Section BSD-19	

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Range: 0 to 360 deg		Lab: 5 minutes On-site: 5 minutes
Straightness & Parallelism		Lab: 2 µm On-site: 2 µm
13. Length Measuring Machine a. Horizontal Measuring System b. Universal Length Machine c. Straightness Machine d. Mic Trac Machine e. Straight Master f. Lathe Machine	Technical Procedure Section BSD-20	
Range: Resolution: 0 mm to 1000 mm 0.1 µm 0 mm to 1000 mm 1 µm 0 mm to 1000 mm 5 µm 0 mm to 1000 mm 10 µm		Lab / On-site: 0.3 µm / 0.5 µm 1 µm / 2 µm 2 µm / 5 µm 5 µm / 10 µm
14. Thread Plug Gauge Range: 0.5 mm to 300 mm	Technical Procedure Section BSD-22	Lab: 2 µm On-site: 3 µm
15. Thread Ring Gauge Range: 1 mm to 100 mm	Technical Procedure Section BSD-23	Lab: 2 µm On-site: 3 µm
16. Holtest Micrometer Range: 0 mm to 200 mm	Technical Procedure Section BSD-24	Lab: 2 µm On-site: 3 µm

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (*)
17. Precision level a. Spirit Level b. Inclinometer c. Precision Level d. Digital Level Gauge e. Round Level f. Precision Square Level g. Precision Flat Level h. Adjustable Bench Level i. Micro type Level j. Pocket Level k. Pendulum Accuracy Range: 0 mm to 1000 mm	Technical Procedure Section BSD-25	½ Division
18. Dial Gage Tester / Calibration Tester / Dial Gage Calibrator Range: Resolution: 0 mm to100 mm 0.1 µm 0 mm to 100 mm 1 µm 0 mm to 100 mm 10 µm	Technical Procedure Section BSD-26	Lab / On-site 0.3 µm / 0.5 µm 1 µm / 2 µm 10 µm / 10 µm
19. Lever Measuring Instruments a. Mu-Checker b. Inductive probe Range: Resolution: 0 mm to 10 mm 0.1 µm 0 mm to 10 mm 1 µm 0 mm to 10 mm 10 µm	Technical Procedure Section BSD-27	Lab / On-site 0.3 µm / 0.5 µm 1 µm / 2 µm 10 µm / 10 µm

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20. Linear Indicating Instruments a. Linear gauge b. Linear Transducer c. Digimatic indicator d. Lever Gauge	Technical Procedure Section BSD-28	
Range: Resolution: 0 mm to 100 mm 0.1 µm 0 mm to 100 mm 1 µm 0 mm to 100 mm 10 µm		Lab / On-site 0.3 µm / 0.5 µm 1 µm / 2 µm 10 µm / 10 µm
21. Bore Gauge a. Length Accuracy b. Bore gage c. Bore gage (for extra small holes) d. Bore gage (small holes) e. Absolute Digimatic Bore gage f. Dial Bore Gage g. Bore Gage (for blind holes) h. Small Hole gage set i. Telescoping Gage set	Technical Procedure Section BSD-29	
Range: 0 mm to 600 mm		Lab / On-site 1 µm / 2 µm
22. Feeler Gauge Range: Up to 10 mm	Technical Procedure Section BSD-31	Lab / On-site 1 µm / 2 µm
23. Linear height Gauge Range: 0 mm to 600 mm 0 mm to 1000 mm	Technical Procedure Section BSD-34	Lab / On-site 2 µm / 3 µm 3 µm / 5 µm

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24. Micrometer Head	Technical Procedure Section BSD-35		
Range:		Lab	On-site
0 mm to 25 mm		1 µm	2 µm
0 mm to 50 mm		1 µm	2 µm
0 mm to 100 mm		1 µm	2 µm
		Lab	On-site
25. Depth Micro checker/Caliper checker	Technical Procedure Section BSD-37		
		Lab	On-site
Flatness :		2 µm	3 µm
Parallelism:		Lab	On-site
0 mm to 1000 mm		2 µm	3 µm
Accuracy:		Lab	On-site
0 mm to 1000 mm		1 µm	2 µm
26. Measuring Toolmaker	Technical Procedure Section BSD-39		
Toolmaker Microscope Microscope Smart Scope Vision unit Video Measuring System			
Range:		Lab	On-site
0 mm to 250 mm-Y axis		0.3 µm	0.5 µm
0 mm to 250 mm-Y & Z axis		1 µm	2 µm
0 mm to 360 °		10 µm	10 µm
Magnification up to 100x		0.1 %	0.2 %
27. Measuring Profile	Technical Procedure Section BSD-40		
Profile Projector Optical Comparator			
Range :		Lab	On-site
0 ~ 250 mm-Y axis		0.3 µm	0.5 µm
0 ~ 250 mm-Y & Z axis		1 µm	2 µm
0 ~ 360 °		10 µm	10 µm
Magnification up to 100x		0.1 %	0.2 %

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28. Thickness Standard 28.1 a. Dial thickness Gauge b. Digimatic Thickness Gauge c. Pocket Thickness Gauge d. Surface Profile Gauge e. Light Weight Dial f. Thickness Gauge g. Tube Thickness h. Ultra sonic thickness gauge	Technical Procedure Section BSD-42	
Range : 0 mm to 10 mm 0 mm to 200 mm		Lab / On-site 2 µm / 3 µm 2 µm / 3 µm
28.2 a. Coating Thickness foils	Technical Procedure Section BSD-31	
Range: 0 mm to 10 mm		Lab / On-site 1 µm / 2 µm
29. Geometric Measurement a. Radius Gauge b. Pitch Gauge c. Taper Gauge d. Jigs e. Step Block f. Fixtures g. Angle Gauge h. Limit Gauges i. Height Setting Gauge j. Depth gauge	Technical Procedure Section BSD-51	

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		Lab	On-site
Flatness:		2 µm	3 µm
Parallelism: 0 to 300 mm		Lab 2 µm	On-site 3 µm
Straightness: 0 mm to 1500 mm		Lab 2 µm	On-site 3 µm
Angle: 0 deg to 360 deg		Lab 5 minutes	On-site 5 minutes
Distance/Length: 0 mm to 1000 mm		Lab 4 µm	On-site 5 µm
Radius: 0 mm to 100 mm		Lab 4 µm	On-site 5 µm
Diameter: 0 mm to 200 mm		Lab 3 µm	On-site 5 µm
30. Test Sieve	Technical Procedure Section BSD-52		
a. Metal Cloth wire size Range: Up to 15 mm		Lab 5 µm	On-site 8 µm
b. Perforated Metal Plate Range: Up to 125 mm		Lab 8 µm	On-site 10 µm

* A reported uncertainty will be that for the instrument itself during calibration plus the appropriate measurement capability of the laboratory. The uncertainties are based on an estimated confidence probability of approximately 95% unless otherwise stated.

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Approved Signatories

Mr B Balamurga Redhy	) For all items
Mr Sekar Karuppiah	) For all items B and C (except Liquid-in-glass thermometer)
Mr R Gnanasekar	) Only for item B1 to B9

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid calibration results. The **management system requirements** in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 **Quality Management Systems — Requirements** and are aligned with its pertinent requirements.