

Schedule

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Certificate No. : LA-2017-0666-C
Issue No. : 09
Date : 04 September 2024
Expiry of Certificate : 05 September 2028
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FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD / FREQUENCY	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A. <u>Electrical (Lab & Site)</u> A1. Calibration of Resistance Measuring Instruments (2 Wire) 0-10.9999 Ω 11 Ω -32.9999 Ω 33 Ω -109.9999 Ω 110 Ω -329.9999 Ω 0.330 k Ω -1.099999 k Ω 1.1 k Ω -3.299999 k Ω 3.3 k Ω -10.99999 k Ω 11 k Ω -32.99999 k Ω 33 k Ω -109.9999 k Ω 110 k Ω -329.9999 k Ω 330k Ω -1.0999999 M Ω 1.1 M Ω -3.299999 M Ω 3.3 M Ω -10.99999 M Ω 11 M Ω -32.99999 M Ω 33 M Ω -109.9999 M Ω 110 M Ω -329.9999 M Ω 330 M Ω -1100 M Ω	Technical Procedure Section BSE-01 Issue 05	0.012 Ω 0.016 Ω 0.018 Ω 0.027 Ω 0.000043k Ω 0.00027 k Ω 0.00044 k Ω 0.0019 k Ω 0.0037 k Ω 0.020 k Ω 0.000039 M Ω 0.00029 M Ω 0.0013 M Ω 0.009 M Ω 0.05 M Ω 1 M Ω 13 M Ω
A2. Calibration of Resistance Measuring Instruments (4 wire) 0 to 10.9999 Ω 11 Ω to 32.9999 Ω 33 Ω to 109.9999 Ω	Technical Procedure Section BSE-01 Issue 05	0.012 Ω 0.016 Ω 0.018 Ω

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110 Ω to 329.9999 Ω 330 Ω to 1.099999 k Ω 1.1 k Ω to 3.299999 k Ω 3.3 k Ω to 10.99999 k Ω 11 k Ω to 32.99999 k Ω 33 k Ω to 109.9999 k Ω		0.027 Ω 0.00043 k Ω 0.00027 k Ω 0.00044 k Ω 0.0019 k Ω 0.0037 k Ω
A3. Calibration of Resistance Measuring Instruments (2 or 4 Wire) 0.001 Ω to 0.01 Ω 0.01 Ω to 0.1 Ω 0.1 Ω to 0.999 Ω 1.0 Ω to 9.999 Ω 10.0 Ω to 99.99 Ω 100.0 Ω to 0.9999 k Ω 1.0 k Ω to 9.999 k Ω 10.0 k Ω to 99.99 k Ω 100.0 k Ω to 0.9999 M Ω 1.0 M Ω to 9.999 M Ω 10.0 M Ω to 100 M Ω	Technical Procedure Section BSE-02 Issue 05 Using Decade Resistance Box	0.0002 Ω 0.0012 Ω 0.0058 Ω 0.023 Ω 0.058 Ω 0.58 Ω 0.012k Ω 0.12k Ω 0.0012M Ω 0.012 M Ω 1.2 M Ω
A4. a Calibration of Milliohm meters 10 m Ω 30 m Ω 50 m Ω 100 m Ω 330 m Ω 470 m Ω b Calibration of Low Resistance Meter 10 $\mu\Omega$ 50 $\mu\Omega$ 100 $\mu\Omega$ 1m Ω 10m Ω 100m Ω 1 Ω	Technical Procedure Section BSE-02 Issue 05	5.3 m Ω 1.9 m Ω 0.7 m Ω 3 m Ω 19 m Ω 15 m Ω 0.04 $\mu\Omega$ 0.2 $\mu\Omega$ 0.2 $\mu\Omega$ 0.002 m Ω 0.013 m Ω 0.13 m Ω 0.001 Ω
A5. High Voltage Resistance Measuring Instruments 10.00 k Ω to 39.99 k Ω 40.00 k Ω to 99.99 k Ω 100.00 k Ω to 199.99 k Ω	Technical Procedure Section BSE-03 Issue 05	0.093 k Ω 0.23 k Ω 0.46 k Ω

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200.00 k Ω to 999.9 k Ω 1.000 M Ω to 9.999 M Ω 10.00 M Ω to 100.00 M Ω 100.00 M Ω to 499.9 M Ω 500.0 M Ω to 999.9 M Ω 1 G Ω to 10 G Ω 10 G Ω to 100 G Ω 100 G Ω to 1000 G Ω 1 T Ω to 10 T Ω		2.4 k Ω 0.038 M Ω 0.6 M Ω 3 M Ω 7.5 M Ω 0.06 G Ω 2 G Ω 18 G Ω 0.36 T Ω
A6. Calibration of Resistance Sourcing Instruments 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 0.1 M Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω	Technical Procedure Section BSE -18 Issue 05	0.38 m Ω 3.8 m Ω 22 m Ω 0.22 Ω 2.2 Ω 0.032 k Ω 1 k Ω 0.12 M Ω
A7. Calibration of DC Voltage Measuring Instruments 0 mV to 329.9999 mV 0.330 V to 3.299999 V 3.30 V to 32.99999 V 33 V to 329.9999 V 330 V to 1000.000 V	Technical Procedure Section BSE-04 Issue 05	0.0061 mV 0.000031 V 0.00034 V 0.0048 V 0.015 V
A8. Calibration of DC Voltage Sourcing instruments 0 to 100 mV 0.101 V to 1 V 1.1 V to 10 V 10.1 V to 100 V 100.1 V to 1000 V 1 kV to 10 kV	Technical Procedure Section BSE-13 Issue 05	0.0076 mV 0.000047 V 0.00041 V 0.0053 V 0.054 V 0.041 kV

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A9. Calibration of AC Voltage Measuring Instruments	10.1 kV to 20 kV	0.46 kV
	20.1 kV to 30 kV	0.35 kV
	30.1 kV to 40 kV	0.92 kV
	Technical Procedure Section BSE-05 Issue 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
		0.024 mV 0.0087 mV 0.0098 mV 0.029 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
		0.091 mV 0.041 mV 0.044 mV 0.089 mV 0.21 mV 0.51 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
		0.00087 V 0.00041 V 0.0005 V 0.00075 V 0.0017 V 0.0061 V
	3.3 V to 32.9999 V	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 90 kHz
		0.0088 V 0.0041 V 0.0061 V 0.0087V 0.022 V
	33 V to 329.999 V	45 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 90 kHz
		0.047 V 0.053 V 0.07 V 0.08 V 0.35 V

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330 V to 750 V	45 Hz to 1 kHz	0.19 V
	1 kHz to 5 kHz	0.16 V
	5 kHz to 8 kHz	0.18 V
750V to 1020 V	20Hz to 10 kHz	0.25 V
A10. Calibration of AC Voltage Sourcing Instruments	Technical Procedure Section BSE-14 Issue 05	
1 mV to 100 mV	10 Hz to 1 kHz	0.086 mV
	1 kHz to 50 kHz	0.15 mV
0.101 V to 1 V	10 Hz to 1 kHz	0.00068 V
	1 kHz to 50 kHz	0.0015 V
	1 kHz to 100 kHz	0.007 V
1.1 V to 10 V	10 Hz to 1 kHz	0.0068 V
	1 kHz to 50 kHz	0.015 V
10.1 V to 100 V	10 Hz to 1 kHz	0.068 V
	1 kHz to 50 kHz	0.15 V
100.1 V to 700 V	10 Hz to 1 kHz	0.49 V
	1 kHz to 20 kHz	0.66 V
	20 kHz to 50 kHz	1.1 V
0.701 kV to 10 kV	50 to 60 Hz	0.05 kV
10.1 kV to 20 kV	50 Hz	1.2 kV
20.1 kV to 28 kV	50 Hz	1.6 kV
A11. Calibration of DC Current Measuring Instruments	Technical Procedure Section BSE-06 Issue 05	
1 µA to 329.999 µA		0.054 µA
0.330 mA to 3.29999 mA		0.0003 mA
3.30 mA to 32.9999 mA		0.0026 mA
33 mA to 329.999 mA		0.028 mA
0.330 A to 1.0 A		0.00019 A
1.01 A to 2.0 A		0.0012 A
2.01 A to 10.0 A		0.0048 A
10.01 A to 20.5 A		0.019 A

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A12. Calibration of DC Current Clamp Meters 0 to 10 A 10.1 A to 50 A 50.1 A to 100 A 100.1 A to 500 A 501 A to 1000 A	Technical Procedure Section BSE-07 Issue 05	0.1 A 0.38 A 0.54 A 2.5 A 4.7 A
A13. Calibration of DC Current Sourcing Instruments 10 μ A to 100 μ A 0.101 mA to 1 mA 1.1 mA to 10 mA 10.1 mA to 100 mA 0.101 A to 1.0 A 1.01 A to 2 A 2.01 A to 50 A 50.1 A to 100 A	Technical Procedure Section BSE-15 Issue 05	2.4 μ A 0.0024 mA 0.0062 mA 0.058 mA 0.0012 A 0.0029 A 0.29 A 0.58 A
A14. Calibration of AC Current Measuring instruments 29 μ A to 329.999 μ A 0.330 mA to 3.2999 mA 3.3 mA to 32.999 mA 33 mA to 329.99 mA 0.330 A to 1.0 A	Technical Procedure Section BSE-08 Issue 05 10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz 10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz 10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz 10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 10 kHz	0.47 μ A 0.40 μ A 4.4 μ A 0.0034 mA 0.0027 mA 0.026 mA 0.025 mA 0.013 mA 0.11 mA 0.25 mA 0.12 mA 1.2 mA 0.0015 A 0.00048 A 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	0.0030 A 0.0013 A 0.043 A
2.01 A to 10.0 A	45 Hz to 1 kHz 1 kHz to 5 kHz	0.01 A 0.23 A
10.1 A to 20.5 A	45 Hz to 1 kHz 1 kHz to 5 kHz	0.03 A 0.47 A
A15. Calibration of AC Current Clamp meters	Technical Procedure Section BSE-08 Issue 05	
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
A16. Calibration of AC Current Sourcing Instruments	Technical Procedure Section BSE-16 Issue 05	
600 µA to 1000 µA 1 mA to 10 mA 10 mA to 100 mA 0.101 A to 1 A 1.01 A to 2 A 2.01 A to 50 A 50.01 A to 100 A	20Hz to 1 kHz 20Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 50 Hz to 60 Hz 50 Hz to 60 Hz	13 µA 0.35mA 0.49mA 0.0013 A 0.0041A 0.16 A 0.3 A
A17. Calibration of Frequency Measuring Instruments	Technical Procedure Section BSE-09 Issue 05	
a 0.01 Hz to 119.99 Hz 120.0 Hz to 1.199 kHz 1.2 kHz to 11.999 kHz 12.00 kHz to 100.00 kHz 100.10 kHz to 1199.9 kHz 1.200 MHz to 2.000 MHz		5.8E-03 Hz 5.8E-04 kHz 5.8E-04 kHz 5.8E-03 kHz 5.8E-04 MHz 5.8E-04 MHz

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b 10Hz ~ 100 Hz 0.1kHz ~ 1kHz 1kHz ~ 10kHz 10kHz ~ 100kHz 100kHz ~ 500kHz 500kHz ~ 1000 kHz 1MHz ~ 10MHz 10MHz ~ 100MHz 100MHz ~ 300MHz	Technical Procedure Section BSE-21 Issue 05 Ref: Fluke 5520A & SC 600	0.0002 Hz 0.0019 kHz 0.000026 kHz 0.00019 kHz 0.00097 kHz 0.0019 kHz 0.000019 MHz 0.00019 MHz 0.00058 MHz
A18. Calibration of Capacitance Measuring Instruments 0.19 nF to 0.3999 nF 0.4 nF to 1.0999 nF 1.1 nF to 3.2999 nF 3.3 nF to 10.9999 nF 11 nF to 32.9999 nF 33 nF to 109.999 nF 110 nF to 329.999 nF 0.33 µF to 1.09999 µF 1.1µF to 3.29999 µF 3.3 µF to 10.9999 µF 11µF to 32.9999 µF 33 µF to 109.9999 µF 110 µF to 329.999 µf 0.33 mF to 1.09999 mF 1.1 mF to 3.2999 mF 3.3 mF to 10.9999 mF 11.1 mF to 32.9999 mF 33 mF to 110 mF	Technical Procedure Section BSE-10 Issue 05	0.0096 nF 0.012 nF 0.021 nF 0.033 nF 0.16 nF 0.31 nF 1.1 nF 0.0031 µF 0.011 µF 0.031 µF 0.15 µF 0.49 µF 1.6 µF 0.0047 mF 0.014 mF 0.046 mF 0.22 mF 1 mF
A19. Calibration of Inductance Measuring Instruments a 1 mH 10 mH 20 mH 30 mH 50 mH 100 mH 1 H 10 H	Technical Procedure Section BSE-11 Issue 05 1kHz	0.015 mH 0.11 mH 0.2 mH 0.3 mH 0.51 mH 1.1 mH 0.012H 1.2 H

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b 100μH to 1000μH 1mH to 10mH 10mH to 100mH 100mH to 1000mH 1H to 10H	Ref: Decade Inductance Box 1 kHz	12 μH 0.12 mH 1.2 mH 12 mH 0.12 H
A20. Calibration of Power Measuring Instruments 0.1 W to 1000 W 1.1 kW to 2 kW 2.1 kW to 14 kW	Technical Procedure Section BSE-17 Issue 05 DC & 40 Hz to 60 Hz Ref: Transmille 2041A	0.0082 W 0.0017 kW 0.0087 kW
A21. Calibration of Digital Timer, Analog Timer, Stopwatch a 1 to 60 s 61 to 600 s 601 to 1200 s 1201 to 1800 s 1801 to 3600 s 3601 s to 7200 s b 1 s to 86400 s	Technical Procedure Section BSE-12 Issue 05 Ref: Stopwatch Ref: Universal Counter	0.07 s 0.09 s 0.11 s 0.14 s 0.26 s 0.49 s 0.04 s
A22. Calibration of Oscilloscope Vertical Deflection ± 1mVp-p to ± 100mVp-p ± 100 mVp-p to ± 1 Vp-p ± 1 Vp-p to ± 6 Vp-p ± 1 mVp-p to ± 100 mVp-p ± 100 mVp-p to ± 1 Vp-p ± 1 Vp-p to ± 100 Vp-p Horizontal Deflection 2 ns to 100 ns 100 ns to 50 ms 50 ms to 5 s	Technical Procedure Section BSE-19 Issue 05 50 Ω Input 1 MΩ Input	0.46 mV 0.0046 V 0.019 V 0.46 mV 0.0047 V 0.47 V 0.058 ns 0.03 ms 0.019 s

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Bandwidth 50 kHz to 100 MHz 100 MHz to 300 MHz 300 MHz to 600 MHz		0.29 dB 0.33 dB 0.5 dB
A23. Calibration of RCD Trip Current Measuring 3 mA to 30 mA 30 mA to 300 mA 300 mA to 1 A	Technical Procedure Section BSE-20 Issue 05	0.35 mA 3.5 mA 0.012 A
A24. Calibration of Frequency Sourcing Instruments	Technical Procedure Section BSE-22 Issue 05	
a 3 Hz ~ 10 Hz 10 Hz ~ 100 Hz 0.100 kHz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 100 kHz 100 kHz ~ 300 kHz	Ref: 6.5 DMM	0.0081 Hz 0.067 Hz 0.00011 kHz 0.00081 kHz 0.0081 kHz 0.024 kHz
b 1 Hz ~ 10 Hz 10 Hz ~ 100 Hz 0.100 kHz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 100 kHz 100 kHz ~ 500 kHz 0.5 MHz ~ 1 MHz 1 MHz ~ 10 MHz	Ref: 8.5 DMM	0.0058 Hz 0.012 Hz 0.02 kHz 0.02 kHz 0.023 kHz 0.0611 kHz 0.00014 MHz 0.0012 MHz
c 10 Hz ~ 100 Hz 100 Hz ~ 1000 Hz 1 kHz ~ 10 kHz 10 kHz ~ 100 kHz 100 kHz ~ 500 kHz 0.5 MHz ~ 1 MHz 1 MHz ~ 10 MHz 10 MHz ~ 100 MHz 100 MHz ~ 300 MHz	Ref: Universal Counter	0.0059 Hz 0.000011 Hz 0.0000014 kHz 0.0000045 kHz 0.00001 kHz 0.000014 kHz 0.0000023 MHz 0.0000003 MHz 0.000002 MHz

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A25. Calibration of Worksurfaces – Resistance Measurements ESD Mat, Dissipative Mat, Static Mat, Rubber Mat, Ground Mat $\leq 1.00E+03\Omega$ $\leq 1.00E+04\Omega$ $\leq 1.00E+05\Omega$ $\leq 1.00E+06\Omega$ $\leq 1.00E+07\Omega$ $\leq 1.00E+08\Omega$ $\leq 1.00E+09\Omega$ $\leq 1.00E+10\Omega$ $\leq 1.00E+11\Omega$ $\leq 1.00E+12\Omega$	Technical Procedure Section BSE-23 Issue 05	$1.6E+01\Omega$ $1.3E+02\Omega$ $1.3E+03\Omega$ $1.6E+04\Omega$ $1.3E+05\Omega$ $1.3E+06\Omega$ $6.2E+07\Omega$ $1.3E+08\Omega$ $2.4E+09\Omega$ $2.2E+10\Omega$
A26. Calibration of Surface Resistance Meter $\leq 1.00E+03\Omega$ $\leq 1.00E+04\Omega$ $\leq 1.00E+05\Omega$ $\leq 1.00E+06\Omega$ $\leq 1.00E+07\Omega$ $\leq 1.00E+08\Omega$ $\leq 1.00E+09\Omega$ $\leq 1.00E+10\Omega$ $\leq 1.00E+11\Omega$ $\leq 1.00E+12\Omega$	Technical Procedure Section BSE-24 Issue 05	$1.6E+02\Omega$ $1.6E+03\Omega$ $2.0E+04\Omega$ $2.7E+05\Omega$ $6.2E+06\Omega$ $9.1E+07\Omega$ $2.4E+09\Omega$ $2.4E+10\Omega$ $2.4E+10\Omega$ $2.4E+10\Omega$

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A27. Calibration of Capacitance Sourcing 0.1nF ~ 1nF 1nF ~ 10nF 10nF ~ 100nF 0.1uF ~ 1uF 1uF ~ 10uF 10uF ~ 100uF	Technical Procedure Section BSE-25 Issue 05	0.012nF 0.058nF 0.58nF 0.0058uF 0.058uF 0.58uF
A28. Calibration of Static Field Meters 0V ~ 1000V 1kV ~ 5kV 5kV ~ 10kV	Technical Procedure Section BSE-26 Issue 05	9.4V 0.023kV 0.041kV
A29. Calibration of Welding Machine a DC Voltage 0V ~ 50V 50V ~ 100V b DC Current 0A ~ 600A 600A ~ 1000A c AC Voltage 0.01V ~ 50V 50V ~ 100V d AC Current 0.01A ~ 600A 600A ~ 1000A	Technical Procedure Section BSE-27 Issue 05 (45Hz to 60Hz) (45Hz to 60Hz)	0.017V 0.059V 15A 29A 0.23V 0.87V 15A 29A

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B. <u>Mechanical (Lab & Site)</u> B1. 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 Issue 05	4.8 mbar
B2. Non-Oil/Oxygen Pressure Instruments Range : 0.000 to 2.000 inH ₂ O -13.7 to 30 psi 0 to 1000 psi 10 psi to 10000 psi	Technical Procedure Section BSM-01, BSM-02, BSM-03 Issue 05 & BSM-04 Issue 05	0.013 inH ₂ O 0.01 psi 0.12 psi 1.4 psi
B3. Pneumatic Instruments Type of Instruments: Pneumatic Gauge Calibrators Digital Indicators Data Logger Manometers Transducer Chart Recorders Magnehelic gauge	Technical Procedure Section BSM-02, BSM-03 Issue 05 & BSM-04 Issue 05	

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Range : 0.000 to 2.000 inH₂O -13.7 to 30 psi 0 to 1000 psi B4. Vacuum Instruments Type of Instruments: Digital Indicator Torr Meter Vacuum Gauges Digital Indicator Manometer Calibrators Magnehelic Gauge and High Vacuum Sensors Range : 10 to 0.1 Torr 0.1 to 1E-2 Torr 1E-2 to 1E-4 Torr 1E-4 Torr to 1E-5 Torr	Technical Procedure Section BSM-05 Issue 05	0.013 inH₂O 0.01 psi 0.12 psi
B5. Hydraulic Pressure Instruments Type of Instruments: a. Oil Pressure Gauge Distilled Water Pressure Gauge Pressure Calibrator Digital Indicator Manometers Controller Data Logger, Chart Recorder, Pressure Switches, Pressure transducer and Transmitters	Technical Procedure Section BSM-01 Issue 05	21% of reading 19% of reading 22% of reading 29% of reading

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Range : 0 to 16 000 psi 0 to 2500 bar b. Ultra High-Pressure Measuring Instruments Pressure Gauge Pressure Transmitters Pressure Transducers Pressure Chart Recorders Pressure Force Gauge Pressure Calibrators Digital Indicators Pressure Controllers Data Loggers Range: 0~60000 psi	Deadweight tester High Pressure Calibrator Technical Procedure Section BSM 15 Issue 05	0.022 % of Reading 1 bar
B6. Dead Weight Testers Type of Instruments: Hydraulic Oil Dead Weight Tester (Cross Float) Range : 0 to 16000 psi	Technical Procedure Section BSM-01 Issue 05	41 psi
B7. Differential Pressure Type of Instruments: Pneumatic Differential Gauge Switches Pneumatic Differential Indicators and Magnehelic Gauge Manometers Flowmeters Anemometer Velometer Balometer	Technical Procedure Section BSM-04 Issue 05	0.022 % of Reading

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Range: a. 0 to 2 inH₂O b. -1000 to 1000 Pa		0.013 inH₂O 3.4 Pa
B8. Force Gauge Instruments Range : 0 to 1000 psi 0 to 16000 psi	Technical Procedure Section BSM-01 & BSM-02 Issue 05 Pneumatic Pressure Calibrator Deadweight tester/ High Pressure Calibrator	0.12 psi 0.022 % of reading
B9. Pressure Relief Valve Instruments Gas Up to 70 bar	Technical Procedure Section BSM-07 Issue 05	0.29% of reading
B10. Non-Contact & Contact Tachometer Instruments Non-Contact Tachometer 10 rpm to 600 rpm 600 rpm to 6000 rpm 6000 rpm to 30000 rpm 30000 rpm to 60000 rpm 60000 rpm to 90000 rpm Contact Tachometer 10 rpm to 100 rpm 100 rpm to 1000 rpm 1000 rpm to 3000 rpm 3000 rpm to 4800 rpm	Technical Procedure Section BSM-08 Issue 05	0.04 rpm 0.22 rpm 1.3 rpm 2.5 rpm 3.4 rpm 0.19 rpm 1.1 rpm 1.3 rpm 1.6 rpm

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B11. 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 1 mg to 20 mg 20 mg to 50 mg 50 mg to 100 mg 100 mg to 200 mg 200 mg to 500 mg 500 mg to 220 g 220 g to 500 g 500 g to 1000 g 1000 g to 5000 g 5000 g to 10000 g 10000 g to 24000 g 24 kg to 60 kg 60 kg to 200 kg 200 kg to 300 kg 300 kg to 500 kg 500 kg to 600 kg 600 kg to 1000 kg	Technical Procedure Section BSM-09 Issue 05	0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.14 mg 0.15 mg 1.3 mg 2 mg 0.01 g 0.14 g 0.006 kg 0.015 kg 0.063 kg 0.095 kg 0.12 kg 0.14 kg

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B12. Calibration of Standard Weights/ Test Weights/ Precision Weights OIML Class M3 Weights or equivalent 1 g to 50 g 50 g to 200 g 200 g to 500 g 500 g to 1 kg 1 kg to 2 kg 2 kg to 5 kg 5 kg to 10 kg 10 kg to 20 kg OIML Class M2 Weights or equivalent 1 kg to 5 kg 5 kg to 10 kg 10 kg to 20 kg OIML Class M1 Weights or equivalent 2 kg to 5 kg 5 kg to 10 kg 10 kg to 20 kg OIML Class F1 Weights or equivalent 1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	Technical Procedure Section BSM-12 Issue 05	0.0002 g 0.0002 g 0.012 g 0.012 g 0.012 g 0.012 g 0.058 g 0.12 kg 0.0058 kg 0.029 kg 0.058 kg 0.012 kg 0.029 kg 0.058 kg 0.011 mg 0.014 mg 0.014 mg 0.014 mg 0.014 mg 0.016 mg 0.016 mg 0.022 mg 0.023 mg 0.000011 g 0.000012 g 0.000013 g 0.000014 g 0.000044 g 0.00028 g 0.0004 g 0.00061 g 0.006 g 0.009 g 0.009 g 0.00009 kg 0.00009 kg 0.00013 kg

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OIML Class E2 Weights only 1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg	Technical Procedure Section BSM-20 Issue 05	0.0025 mg 0.0025 mg 0.0025 mg 0.0025 mg 0.0025 mg 0.0033 mg 0.0042 mg 0.003 mg 0.004 mg 0.000004 g 0.000006 g 0.000006 g 0.000007 g 0.000009 g 0.00002 g 0.00003 g 0.00004 g 0.001 g 0.000001 kg 0.000001 kg
B13. Torque Measuring Instruments a. 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: 10 to 100 ozf.in. 5 to 50 lb.in. 50 to 150 lb.in. 12.5 to 50 lbft. 50 to 100 lbft. 100 to 250 lbft. 250 to 500 lbft. 500 to 1000 lbft. 1000 to 2000 lbft.	Technical Procedure Section BSM-10 Issue 05	1.3 ozf.in 0.32 lb.in. 0.56 lb.in. 0.15 lbft. 0.56 lbft. 0.76 lbft. 3.2 lbft. 6.5 lbft. 13 lbft

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b. Torque Hand Tools Torque Wrench Digital Torque Wrench Dial Indicating Type Torque Wrench Indicator Plate Torque Wrench Adjustable Torque Wrench Preset Torque Wrench Data Printout Digital Torque Wrench Hydraulic Torque Wrench Range: 5 to 50 lb.in 50 to 250 lb.in 20 to 100 lb.ft 100 to 600 lb.ft 600 to 2000 lb.ft	Technical Procedure Section BSM-10 Issue 05 Based on ISO 6789:2017	0.38 % of reading 0.50 % of reading 0.67 % of reading 0.64 % of reading 0.77 % of reading
B14. Torque Meter Tester Type of Instruments: Torque Checker Torque Meter Tester Torque Analyzer Range : 0 to 10 kgf.cm 10 to 50 kgf.cm 50 to 100 kgf.cm	Technical Procedure Section BSM-11 Issue 05	0.014 kgf.cm 0.14 kgf.cm 0.16 kgf.cm
B15. Force Measuring Instruments Type of Instruments : Push Pull Gauge Force Gauge Tension Meter Gram Gauge Manual Test Stands Motorized Test Stands Dial Tension Gauge Tension Gauge Wire Tension Meter	Technical Procedure Section BSM-13 Issue 05	

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Load Gauge Spring Balance Tensile Tester Cable Tension Meter Force Indicator Dynamometer Belt Tension Gauge Strap Tension Meter Range : 1 gf to 100 gf 100 gf to 1 kgf 1 kgf to 100 kgf 100 kgf to 400 kgf 400 kgf to 600 kgf		0.1 gf 0.008 kgf 0.07 kgf 0.25 kgf 0.39 kgf
B16. Rubber Hardness Tester Type of Instruments Hand Durometer Digital Durometer Pencil Durometer Multi Scale Durometer Dial Durometer Tire Hardness Durometer Pocket Durometer Direct Force Verification Range : Up to 100 Div Durometer Type A, B, C	Technical Procedure Section BSM-14 Issue 05 Type A, B, C, D	0.31 Div
B17. Hardness testing machine (Lab & Site) In-direct verification methods of Hardness machine Handheld hardness tester Analog Tester Portable hardness Tester	Technical Procedure Section BSM-16 Issue 05	

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Impressor Tester Digital Hardness Tester Brinell Hardness tester HRA BLOCK 30~40 HRA 65~75 HRA 80~85 HRA HRBW BLOCK 45~60 HRBW 60~70 HRBW 90~100 HRBW HRC BLOCK 45~60 HRC 60~70 HRC 90~100 HRC		1.3 HRA 1.3 HRA 0.8 HRA 2.9 HRBW 2.9 HRBW 1.3 HRBW 1.3 HRC 1.3 HRC 0.8 HRC
B18. Sound Pressure level Devices (Lab / Site) Sound Level meter and Noise Analyzers Range: 94dB@1000 Hz 114dB@1000 Hz	Technical Procedure Section BSM-17 Issue 05	A-weighting / C - weighting 0.32 dB / 0.34 dB 0.33 dB / 0.33 dB
B19. Rotational Speed Measurements (Lab/Site) Range: 10~60 rpm >60~100 rpm >100~500 rpm >500~1000 rpm >1000~5000 rpm >5000~10000 rpm >10000~50000 rpm >50000~90000 rpm	Technical Procedure Section BSM-18 Issue 05	0.028 rpm 0.18 rpm 0.26 rpm 1.1 rpm 2.6 rpm 4 rpm 13 rpm 22 rpm

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B20. Volume Measuring Instruments (Lab/site) Volumetric Apparatus 1 ml ~ 10 ml >10 ml ~ 100 ml >100 ml ~ 1000 ml >1000 ml~ 5000 ml Seraphin Tank 0~ 20 l >20 l ~100 l Burettes >1 ml ~ 10 ml >10 ml ~ 100 ml >100 ml ~ 300 ml Pipettes 1 µl ~ 10 µl >10 µl ~ 100 µl >100 µl ~ 1000 µl >1ml ~5 ml >5 ml ~ 50 ml	Technical Procedure Section BSM-19 Issue 05	0.029 ml 0.58 ml 5.8 ml 58 ml 0.02 l 0.58 l 0.0057 ml 0.057 ml 0.59 ml 0.19 µl 0.33 µl 0.6 µl 0.029 ml 0.12 ml
B21. Gas Flow meters -Flow meter -Digital Flow meter -Rotameters 0~500 sccm 0~10 lpm 10~250 lpm	Technical Procedure Section BSM-21 Issue 05	<u>Inlab</u> / <u>Onsite</u> 1.8 sccm / 7.5 sccm 0.052 lpm / 0.18 lpm 1.1 lpm / 4.7 lpm

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C <u>Temperature (Lab & Site)</u>		
C1. Temperature Measuring Instruments		
a. Glass Thermometer- Total Immersion (Lab)		
Range: Scale Div.	Technical Procedure	
-75 ~ 250 °C 0.02 °C	Section BST-01	0.11°C
-75 ~ 250 °C 0.05 °C	Issue 05	0.13°C
-75 ~ 250 °C 0.1 °C		0.16°C
-75 ~ 250 °C 0.2 °C		0.26°C
-75 ~ 250 °C 0.25 °C		0.31°C
-75 ~ 250 °C 0.5 °C		0.59°C
-75 ~ 250 °C 1 °C		1.2°C
-75 ~ 250 °C 2 °C		2.3°C
b. Glass Thermometer- Partial Immersion (lab)		
Range: Scale Div.		
-75 ~ 250 °C 0.1 °C		0.16°C
-75 ~ 250 °C 0.2 °C		0.26°C
-75 ~ 250 °C 0.25 °C		0.31°C
-75 ~ 250 °C 0.5 °C		0.59°C
-75 ~ 250 °C 1 °C		1.2°C
-75 ~ 250 °C 2 °C		2.3°C
c. RTD Sensor/ Thermistor Probe Without Indicator		
Range:	Technical Procedure	
- 75 ~ -20°C	Section BST-02	<u>Lab</u> / <u>Site</u>
- 20 ~ 30 °C	Issue 05	0.094 °C / -
30 ~ 100 °C		0.087°C / 0.27 °C
100 ~ 250°C		0.066°C / 0.15 °C
250 ~ 500°C		0.16°C / 0.19 °C
		0.2 °C / 0.25 °C

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d. RTD Sensor/ Thermistor Probe with Indicator Range: -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 250°C 250 ~ 500°C	Technical Procedure Section BST-03 Issue 05	<u>Lab</u> / <u>Site</u> 0.078°C / - 0.036°C / 0.27 °C 0.04°C / 0.15 °C 0.12°C / 0.19 °C 0.17 °C / 0.25 °C
e. Digital Thermometer with sensor, Temperature Switch, Temperature Transmitter, Temperature Transducer, Data Logger with Sensor, Temperature Controller with Sensor, Temperature Indicator with Sensor, Temperature Recorder with Sensor Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 270 °C 270 ~ 500 °C 500 ~ 1000 °C		<u>Lab</u> / <u>Site</u> 0.11 °C / - 0.076 °C / 0.34 °C 0.074 °C / 0.29 °C 0.085 °C / 0.42 °C 0.42 °C / 0.55 °C 1.5 °C / -
f. Thermocouple without Indicator Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~270 °C 270~ 500 °C 500 ~ 1000 °C		<u>Lab</u> / <u>Site</u> 0.26 °C / - 0.25 °C / 0.43 °C 0.25 °C / 0.42 °C 0.47 °C / 0.75 °C 0.74 °C / 0.84 °C 1.7 °C / -
g. Thermocouple with Indicator Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 270 °C 270~ 500 °C 500 ~ 1000 °C		<u>Lab</u> / <u>Site</u> 0.24 °C / - 0.24 °C / 0.37 °C 0.23 °C / 0.37 °C 0.46 °C / 0.71 °C 0.65 °C / 0.83 °C 1.7 °C / -

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C2. Dry Block Calibrator (Lab/Site) Range : -40 ~ 500 °C	Technical Procedure Section BST-05 Issue 05	0.52 °C
C3. Ice Point Range : 0 °C	Technical Procedure Section BST-01, BST-02, BST-03 & BST-04 Issue 05	0.054 °C
C4. a) Calibration of Temperature Indicator (Lab/Site) Type J : -210 ~ 0 °C 0 ~ 600 °C 600 ~ 1200 °C Type K : -200 ~ 0 °C 0 ~ 1000 °C 1000 ~ 1372 °C Type T : -250 ~ 0 °C 0 ~ 400 °C Type R : 0 ~ 200 °C 200 ~ 800 °C 800 ~ 1767 °C Type S : 0 ~ 200 °C 200 ~ 1200 °C 1200 ~ 1767 °C Type N : -200 ~ 0 °C 0 ~ 200 °C 200 ~ 1300 °C	Technical Procedure Section BST-06 Issue 05	<u>Lab</u> / <u>Site</u> 0.32 °C / 0.59°C 0.21°C / 0.56°C 0.28°C / 0.56 °C <u>Lab</u> / <u>Site</u> 0.41°C / 0.77°C 0.34°C / 0.62°C 0.49°C / 0.76 °C <u>Lab</u> / <u>Site</u> 0.74 °C / 0.97°C 0.31°C / 0.43°C <u>Lab</u> / <u>Site</u> 0.88 °C / 2 °C 0.71°C / 1.3°C 0.74°C / 1.3 °C <u>Lab</u> / <u>Site</u> 0.6 °C / 1.6 °C 0.5°C / 1.2 °C 0.59°C / 1.2 °C <u>Lab</u> / <u>Site</u> 0.47 °C / 1.2 °C 0.23 °C / 1.2 °C 0.32 °C / 1.1°C

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Type E : -200 ~ 0 °C 0 ~ 600 °C 600 ~ 1000 °C b) Calibration of Thermocouple Sourcing Instrument (Lab/Site) Type J : -210 ~ 0 °C 0 ~ 600 °C 600 ~ 1200 °C Type K : -200 ~ 0 °C 0 ~ 1000 °C 1000 ~ 1372 °C Type T : -250 ~ 0 °C 0 ~ 400 °C Type R : 0 ~ 200 °C 200 ~ 800 °C 800 ~ 1767 °C Type S : 0 ~ 200 °C 200 ~ 1200 °C 1200 ~ 1767 °C Type N: -200 ~ 0 °C 0 ~ 200 °C 200 ~ 1300 °C Type E : -200 ~ 0 °C 0 ~ 600 °C 600 ~ 1000 °C	Technical Procedure Section BST-06 Issue 05	<u>Lab</u> / <u>Site</u> 0.59 °C / 0.9 °C 0.22 °C / 0.52 °C 0.27 °C / 0.61 °C <u>Lab</u> / <u>Site</u> 0.33 °C / 0.51 °C 0.22 °C / 0.51 °C 0.28 °C / 0.51 °C <u>Lab</u> / <u>Site</u> 0.41 °C / 0.73 °C 0.34 °C / 0.76 °C 0.49 °C / 0.76 °C <u>Lab</u> / <u>Site</u> 0.74 °C / 0.93 °C 0.24 °C / 0.44 °C <u>Lab</u> / <u>Site</u> 0.88 °C / 2 °C 0.71 °C / 1.2 °C 0.75 °C / 1.2 °C <u>Lab</u> / <u>Site</u> 0.61 °C / 1.4 °C 0.51 °C / 1.2 °C 0.6 °C / 1.2 °C <u>Lab</u> / <u>Site</u> 0.5 °C / 1.1 °C 0.24 °C / 1 °C 0.32 °C / 1 °C <u>Lab</u> / <u>Site</u> 0.59 °C / 0.51 °C 0.22 °C / 0.44 °C 0.27 °C / 0.44 °C

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C5. PRT Electrical Simulation Instruments (Lab/Site) a Range : Type PT 100 (385) -200 ~ 100 °C 100 ~ 400 °C 400 ~ 800 °C b PRT Sourcing Instruments (Lab/Site) Range : Type PT 100 (385) -200 ~ 100 °C 100 ~ 400 °C 400 ~ 800 °C	Technical Procedure Section BST-07 Issue 05	<table> <tr> <td><u>Lab</u></td> <td>/</td> <td><u>Site</u></td> </tr> <tr> <td>0.11 °C</td> <td>/</td> <td>0.29 °C</td> </tr> <tr> <td>0.14 °C</td> <td>/</td> <td>0.38 °C</td> </tr> <tr> <td>0.27 °C</td> <td>/</td> <td>0.45 °C</td> </tr> </table> <table> <tr> <td><u>Lab</u></td> <td>/</td> <td><u>Site</u></td> </tr> <tr> <td>0.06 °C</td> <td>/</td> <td>0.29 °C</td> </tr> <tr> <td>0.15 °C</td> <td>/</td> <td>0.33 °C</td> </tr> <tr> <td>0.15 °C</td> <td>/</td> <td>0.36 °C</td> </tr> </table>	<u>Lab</u>	/	<u>Site</u>	0.11 °C	/	0.29 °C	0.14 °C	/	0.38 °C	0.27 °C	/	0.45 °C	<u>Lab</u>	/	<u>Site</u>	0.06 °C	/	0.29 °C	0.15 °C	/	0.33 °C	0.15 °C	/	0.36 °C
<u>Lab</u>	/	<u>Site</u>																								
0.11 °C	/	0.29 °C																								
0.14 °C	/	0.38 °C																								
0.27 °C	/	0.45 °C																								
<u>Lab</u>	/	<u>Site</u>																								
0.06 °C	/	0.29 °C																								
0.15 °C	/	0.33 °C																								
0.15 °C	/	0.36 °C																								
C6. Controlled Temperature Enclosure (Lab/Site) a. Freezers Oven & Furnaces Range : -75 ~ -40 °C -40 ~ 100 °C 100 ~ 200 °C 200 ~ 400 °C 400 ~ 600 °C 600 ~ 1000 °C 1000 ~ 1200 °C b. Autoclaves	Technical Procedure Section BST-08 Issue 05	1.1°C 1.6°C 1.7°C 2.8°C 3 °C 4.1°C 5 °C 0.4 ° C																								
C7. Humidity Chamber (Lab/Site) Humidity Range : 20~ 95 % relative humidity @ (10~50) °C Temperature Range : 10 ~ 50 °C @ (20~ 95) % relative humidity	Technical Procedure Section BST-08 & BST-09 Issue 05	7.2% relative humidity 1.2 °C																								

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C8. Calibration of Surface Probes with/without Indicator (Lab/Site) Range : 50 ~ 150°C 150°C~250°C 250°C~500°C Surface Hot Plates Range: 50 ~ 100 °C 100 ~ 250 °C 250 ~ 500 °C	Technical Procedure Section BST-10 Issue 05 Technical Procedure Section BST-14 Issue 05	1.2°C 1.4°C 2.1°C 3.2°C 3.3°C 5.9°C
C9. Humidity/ Temperature Measuring Instruments (Lab/Site) Reference Used: Hygrogen Air Probes, Datalogger, Weather Meter, Temperature and humidity transmitter, thermohygrometer, Temperature and Humidity Sensor 5 ~ 40 °C 12 ~ 90 % relative humidity 40 ~ 50 °C 12 ~ 90 % relative humidity 10 ~ 40 °C 90 ~ 95 % relative humidity Reference Used: Humidity Chamber Thermohygrograph, Barometer, Datalogger, Thermohygrometer, Humidity Sensor -20 °C ~0 °C 0°C ~60 °C (10 ~ 40) °C (10~95) % relative humidity	Technical Procedure Section BST-11 Issue 05	0.3°C 1.9 % relative humidity 0.3°C 1.9 % relative humidity 0.3°C 1.9 % relative humidity 0.28°C 0.45°C 0.37°C 2.5% relative humidity

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C10. Calibration of Non-Contact Thermometer Measuring (Lab) Spectral Range: 8~14µm Emissivity (ε): 0.95 Range 10 ~ 50 °C 50 ~ 120 °C 120 ~ 250 °C 250 ~ 490 °C	Technical Procedure Section BST-12 Issue 05	1.1 °C 2.2 °C 3.4 °C 4.8 °C
C11. System Accuracy Test a Temperature -60 ~50 °C 50 ~ 200 °C 200 ~ 500 °C 500 ~ 1000 °C b Temperature and Humidity Temperature Range: 10~50 °C Relative Humidity Range: (10 to 70) % Relative Humidity	Technical Procedure Section BST-13 Issue 05	0.8°C 0.9°C 1.3°C 3 °C 0.24°C 2.3 %relative humidity
C12. Dew Point Measuring Instruments Dew point Meter Dew Meters Elcometers Dew point sensors Dew point Transmitters Range -20~60 °C dP	Technical Procedure Section BST-15 Issue 05	0.76°C dP

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D2.	End Rod measurements Standard Rod / Extension Rod Range:	Technical Procedure Section BSD-02 Issue 05	Lab	/	Site
	Up to 500 mm		2 µm	/	3 µm
	>500 mm to 1000 mm		3 µm	/	4 µm
	>1000 mm to 1500 mm		3 µm	/	4 µm
D3.	Caliper Measuring Instruments Super Caliper Solar Caliper Coolant Proof Caliper Digimatic Caliper Vernier Caliper Dial Caliper Carbon Fiber Caliper Long jaw Caliper Back-jaw Caliper Blade type Caliper Tube thickness Caliper Neck Caliper Hook type Vernier Caliper Low force Caliper	Technical Procedure Section BSD-03 Issue 05			
	Range: Resolution:		<u>Lab</u>	/	<u>Site</u>
	0 mm to 500 mm 10 µm		10 µm	/	10 µm
	20 µm		20 µm	/	20 µm
	50 µm		50 µm	/	50 µm
	Range: Resolution:		<u>Lab</u>	/	<u>Site</u>
	0 mm to 1000 mm 10 µm		10 µm	/	10 µm
	20 µm		20 µm	/	20 µm
	50 µm		50 µm	/	50 µm
	Range: Resolution:		<u>Lab</u>	/	<u>Site</u>
	0 mm to 1500 mm 10 µm		10 µm	/	10 µm
	20 µm		20 µm	/	20 µm
	50 µm		50 µm	/	50 µm

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D4.	Height Measuring Instruments	Technical Procedure Section BSD-04 Issue 05			
	Vernier Height Gauge				
	Digimatic Height Gauge				
	Height Gauge				
	Flatness :		Lab	/	Site
			2 µm	/	3 µm
	Parallelism:		Lab	/	Site
	Up to 500 mm		2 µm	/	3 µm
	>500 mm to 1000 mm		2 µm	/	3 µm
	>1000 mm to 1500 mm		3 µm	/	3 µm
Accuracy :					
Range:	Resolution:	Lab	/	Site	
0 mm to 500 mm	10 µm	10 µm	/	10 µm	
	20 µm	20 µm	/	20 µm	
	50 µm	50 µm	/	50 µm	
0 mm to 1000 mm	10 µm	10 µm	/	10 µm	
	20 µm	20 µm	/	20 µm	
	50 µm	50 µm	/	50 µm	
0 mm to 1500 mm	10 µm	10 µm	/	10 µm	
	20 µm	20 µm	/	20 µm	
	50 µm	50 µm	/	50 µm	
D5.	Depth Measuring Instruments	Technical Procedure Section BSD-05 Issue 05			
	Vernier Depth Gage				
	Digimatic Depth Gage				
	Dial Depth Gage				
	Depth Gage				
	Tire Thread Depth Gage				
	Pitch Depth Gage				
	Thread Depth Gage				
	Flatness		Lab	/	Site
	Parallelism		1 µm	/	2 µm
	2 µm	/	3 µm		
Range:	Resolution:	Lab	/	Site	
0 mm to 500 mm	10 µm	10 µm	/	10 µm	
	20 µm	20 µm	/	20 µm	
	50 µm	50 µm	/	50 µm	

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Range: Resolution: 0 mm to 1000 mm 10 µm 20 µm 50 µm D6. Internal Measuring Instruments Stick Micrometers Digimatic Tubular Micrometers Tubular Micrometers Inside Micrometer Accuracy: Range : 0 mm to 1500 mm Extension Rods: Range: Up to 500 mm >500 mm to 1500 mm D7. Depth Micrometers Flatness : Parallelism: Up to 300 mm Accuracy: 0 mm to 300 mm Extension Rods: 0 mm to 300 mm D8. Plunger Indicating Instruments Dial indicator Digimatic indicator Hicator Signal Hicator Back plunger dial indicator Deflection Gauge Special Dial Indicator Micro Indicator	Technical Procedure Section BSD-06 Issue 05 Technical Procedure Section BSD-07 Issue 05 Technical Procedure Section BSD-08 Issue 05	Lab / Site 10 µm / 10 µm 20 µm / 20 µm 50 µm / 50 µm <u>Lab</u> / <u>Site</u> 3 µm / 4 µm <u>Lab</u> / <u>Site</u> 2 µm / 3 µm 3 µm / 4 µm <u>Lab</u> / <u>Site</u> 2 µm / 3 µm <u>Lab</u> / <u>Site</u> 1 µm / 2 µm <u>Lab</u> / <u>Site</u> 2 µm / 3 µm

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Range: Resolution: 0 mm to 100 mm 0.1 μm 1 μm 5 μm 10 μm		<u>Lab</u> / <u>Site</u> 0.3 μm / 1 μm 1 μm / 2 μm 5 μm / 5 μm 10 μm / 10 μm
D9. Lever Indicating Instruments Dial test Indicator Pocket type dial test indicator	Technical Procedure Section BSD -09 Issue 05	
Accuracy: 0 mm to 5 mm		<u>Lab</u> / <u>Site</u> 0.3 μm / 2 μm
D10. Limit Gauges Plain Plug & Pin Gauges	Technical Procedure Section BSD-10 & BSD-11 Issue 05	
Range: Up to 100 mm >100 mm to 300 mm		Lab / Site 1 μm / 2 μm 2 μm / 3 μm
Plain Ring Gauges Range: Up to 100 mm >100 mm to 300 mm		Lab / Site 1 μm / 2 μm 2 μm / 3 μm
Plain Gap Gauges Range: Up to 100 mm >100 mm to 300 mm		Lab / Site 1 μm / 2 μm 2 μm / 3 μm
Other limit Gauges (Including Height, Depth & Length) Range: Up to 100 mm >100 mm to 300 mm		Lab / Site 1 μm / 2 μm 2 μm / 3 μm
Precision Balls Range: Up to 100 mm		Lab / Site 1 μm / 2 μm
D11. Line Standard Steel Ruler Range: 0 mm to 1000 mm	Technical Procedure Section BSD-13 Issue 05	<u>Lab</u> / <u>Site</u> 0.06mm / 0.1 mm

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Scales: Coolant proof Digimatic Scale Units Linear Scale Glass Scale Stage micrometer Scale Objective Scale Microscope Scale Standard Scale Range: 0 mm to 300 mm	Technical Procedure Section BSD-14 Issue 05	<u>Lab</u> 1 µm
D12. Protractor Standard Digimatic Protractor Dial protractor Vernier Protractor Bevel Protractor Range: 0 to 360 degree Straightness & Parallelism	Technical Procedure Section BSD-15 Issue 05	<u>Lab</u> / <u>Site</u> 5 minutes / 5 minutes 2 µm / 2 µm
D13. Length Measuring Machine Horizontal Measuring System Universal Length Machine Straightness Machine Mic Trac Machine Straight Master Lathe Machine Range: Resolution: 0 mm to 100 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	Technical Procedure Section BSD-16 Issue 05	<u>Lab</u> / <u>Site</u> 0.3 µm / 0.5 µm 1 µm / 2 µm 2 µm / 5 µm 5 µm / 10 µm

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D18. Dial Gage Tester/ Calibration Tester/ Dial Gage Calibrator Range: Resolution: 0 mm to 100 mm 0.1 μm 0 mm to 100 mm 1 μm 0 mm to 100 mm 10 μm	Technical Procedure Section BSD-21 Issue 05	<u>Lab</u> / <u>Site</u> 0.3 μm / 0.5 μm 1 μm / 2 μm 10 μm / 10 μm
D19. Lever Measuring Instruments Mu-Checker 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-22 Issue 05	<u>Lab</u> / <u>Site</u> 0.3 μm / 0.5 μm 1 μm / 2 μm 10 μm / 10 μm
D20. Linear Indicating Instruments Linear gauge Linear Transducer Digimatic indicator Lever Gauge Range: Resolution: 0 mm to 100 mm 0.1 μm 0 mm to 100 mm 1 μm 0 mm to 100 mm 10 μm	Technical Procedure Section BSD-23 Issue 05	<u>Lab</u> / <u>Site</u> 0.3 μm / 0.5 μm 1 μm / 2 μm 10 μm / 10 μm
D21. Bore Gauge Length Accuracy Bore Gauge Bore Gauge (for extra small holes) Bore Gauge (small holes) Absolute Digimatic Bore Gauge Dial Bore Gauge Bore Gauge (for blind holes) Small Hole Gage set Telescoping Gage set Range: 0 mm to 600 mm Accuracy Check : 0 to 1 mm	Technical Procedure Section BSD-24 Issue 05	<u>Lab</u> / <u>Site</u> 1 μm / 2 μm

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D22. Feeler Gauge Coating Thickness foils Range: Up to 10 mm	Technical Procedure Section BSD-25 Issue 05	<u>Lab</u> / <u>Site</u> 1 µm / 2 µm
D23. Linear Height Gauge Range: 0 mm to 600 mm 0 mm to 1000 mm	Technical Procedure Section BSD-26 Issue 05	<u>Lab</u> / <u>Site</u> 2 µm / 3 µm 3 µm / 5 µm
D24. Micrometer Head Range: 0 mm to 25 mm 0 mm to 50 mm 0 mm to 100 mm	Technical Procedure Section BSD-27 Issue 05	<u>Lab</u> / <u>Site</u> 1 µm / 2 µm 1 µm / 2 µm 1 µm / 2 µm
D25. Depth Micro Checker/ Caliper Checker Flatness : Parallelism: Accuracy: 0 mm to 1000 mm	Technical Procedure Section BSD-28 Issue 05	<u>Lab</u> / <u>Site</u> 2 µm / 3 µm 2 µm / 3 µm <u>Lab</u> / <u>Site</u> 1 µm / 2 µm
D26. Measuring Toolmaker Toolmaker Microscope Microscope Range: 0 mm to 300 mm-X axis 0 mm to 300 mm-Y & Z axis 0 to 360 ° Magnification up to 100x Perpendicularity measurement	Technical Procedure Section BSD-29 Issue 05	<u>Lab</u> / <u>Site</u> 0.3 µm / 2 µm 1 µm / 2 µm 5 minutes / 1° 0.1 % / 0.2 % 3 µm / 3 µm

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MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD / FREQUENCY	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)																		
D27. Measuring Profile Profile Projector Optical Comparator Range : 0 ~ 300 mm-X axis 0 ~ 300 mm-Y & Z axis 0 ~ 360 ° Magnification up to 100x Perpendicularity measurement	Technical Procedure Section BSD-30 Issue 05	<table> <tr> <td><u>Lab</u></td><td>/</td><td><u>Site</u></td></tr> <tr> <td>0.3 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>1 µm</td><td>/</td><td>2 µm</td></tr> <tr> <td>5 minutes</td><td>/</td><td>1°</td></tr> <tr> <td>0.1 %</td><td>/</td><td>0.2 %</td></tr> <tr> <td>3µm</td><td>/</td><td>3 µm</td></tr> </table>	<u>Lab</u>	/	<u>Site</u>	0.3 µm	/	3 µm	1 µm	/	2 µm	5 minutes	/	1°	0.1 %	/	0.2 %	3µm	/	3 µm
<u>Lab</u>	/	<u>Site</u>																		
0.3 µm	/	3 µm																		
1 µm	/	2 µm																		
5 minutes	/	1°																		
0.1 %	/	0.2 %																		
3µm	/	3 µm																		
D28. Coating Thickness gauge Range : 11 to 2000 µm	Technical Procedure Section BSD-31 Issue 05	<table> <tr> <td><u>Lab</u></td><td></td><td></td></tr> <tr> <td>1.4 µm</td><td></td><td></td></tr> </table>	<u>Lab</u>			1.4 µm														
<u>Lab</u>																				
1.4 µm																				
D29. Geometric Measurement Radius Gauge Pitch Gauge Taper Gauge Jigs Step Block Fixtures Angle Gauge Limit Gauges Height Setting Gauge Depth Gauge Flatness: Parallelism: Straightness: 0 mm to 1500 mm	Technical Procedure Section BSD-32 Issue 05	<table> <tr> <td><u>Lab</u></td><td>/</td><td><u>Site</u></td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> </table>	<u>Lab</u>	/	<u>Site</u>	2 µm	/	3 µm	2 µm	/	3 µm	2 µm	/	3 µm						
<u>Lab</u>	/	<u>Site</u>																		
2 µm	/	3 µm																		
2 µm	/	3 µm																		
2 µm	/	3 µm																		

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Angle: 0 degree to 360 degree		<u>Lab</u> / <u>Site</u> 5 minutes / 5 minutes
Distance/Length: 0 mm to 1000 mm		<u>Lab</u> / <u>Site</u> 4 µm / 5 µm
Radius: 0 mm to 100 mm		<u>Lab</u> / <u>Site</u> 4 µm / 5 µm
Diameter: 0 mm to 200 mm		<u>Lab</u> / <u>Site</u> 3 µm / 5 µm
D30. Test Sieve Metal Cloth wire size Range: Up to 15 mm	Technical Procedure Section BSD-33 Issue 05	<u>Lab</u> / <u>Site</u> 5 µm / 8 µm
Perforated Metal Plate Range: Up to 125 mm		<u>Lab</u> / <u>Site</u> 8 µm / 10 µm
D31. Tape Measurements: Measuring Tape MMC Tape Hook Tape Surveyor Tape UTI Meter Range: Up to 1000 mm Up to 5000 mm Up to 10000 mm Up to 30000 mm Up to 50000 mm Up to 100000 mm	Technical Procedure Section BSD-12 Issue 05	<u>Lab</u> 0.14 mm 0.2 mm 0.29 mm 0.59 mm 1.1 mm 3.9 mm
D32. Ultrasonic Thickness Gauge Range : 0.5 to 200 mm	Technical Procedure Section BSD 34 Issue 05	<u>Lab</u> 0.008 mm

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D33. Dial Thickness Gauge Digimatic Thickness Gauge Range: Up to 12 mm (Resolution :0.001mm) Up to 50 mm (Resolution :0.01mm)	Technical Procedure Section BSD 35 Issue 05	<u>Lab</u> 0.001 mm 0.01 mm
D34. Thread Wire Measurements Range: 0 to 10 mm	Technical Procedure Section BSD 36 Issue 05	<u>Lab</u> 0.0004 mm
D35. Length Diameter Measurements Length: Up to 1 m 1 m to 10 m Diameter: Up to 500mm	Technical Procedure Section BSD 37 Issue 05	<u>Lab & onsite</u> 0.07mm 0.003m 0.01mm
D36. Surface Roughness Tester and Roughness Specimen Surface Roughness Tester Surface Roughness Specimen	Technical Procedure Section BSD 38 Issue 05	<u>Lab & Site</u> 0.1µm 0.1µm
D37. Crimping Tool measurements Length and Height Diameter	Technical Procedure Section BSD 39 Issue 05	<u>Lab</u> 0.005mm 0.005mm
D38. Pi Tape measurements Up to 48 inch	Technical Procedure Section BSD 40 Issue 05	<u>Lab</u> 0.002 inch
D39. Surface Table Measurement Flatness Up to 1500 mm Variation	Technical Procedure Section BSD 41 Issue 05	<u>Lab & Site</u> 2 µm 1 µm

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

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Approved Signatories:

Mr B Balamurga Redhy	- For All Items in A, B, C & D
Mr Raja Ramesh Jakkula	- For All Items in B
Mr Alvin Neo	- For all items in D
Mr Rengaraj Ramesh	- All items in A, B & C, D1-D10, D17-D28, D31-D39
Mr Mahalingam Balaji	- For All items in A, B , C & D17-D27, D35-D38,
Mr Durai Siva	- For items B2-B3 , item B11
Mr Manikandan	- For items B11 , items B2-B3

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 calibration results. 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.