

Schedule

Caltex Pte Ltd
23 Tagore Lane
#01-05/06, #04-08/09/10/11
Tagore 23 Warehouse
Singapore 787601

Certificate No. : LA-2003-0292-C
Issue No. : 22
Date : 24 October 2024
Expiry of Certificate : 10 November 2028
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FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A. Mechanical A1 Low Pressure//Differential Ranges • Gauges • Transducers • Transmitters • Digital Indicators • Photohelic/ Magnehelic Gauges • Manometers • Micromanometers • Differential Pressure Recorders/Calibrators • Velometers • Hook Gauges • Low Differential Switches • Differential Pressure Sensors (Flow meters) • Digital Gauges • Differential Pressure Gauges <u>Lab/Site</u> (-1.0 ~ 1.0) in H ₂ O (-25.0 ~ 25.0) Pa (-5.0 ~ 5.0) in H ₂ O (-10.0 ~ 10.0) in H ₂ O (0.0 ~ 100) mbar	CTTM-M02-2007, Rev. 09	0.002 in H ₂ O 0.4 Pa 0.006 in H ₂ O 0.006 in H ₂ O 1 mbar

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A5 Pneumatic High-Pressure Gauge (Lab/Site) • Low Pressure Gauges • Manometers • Transducer/ Transmitters • Pressure Gauges • Oil Free Gauges • Gas Gauges • Robinair Gauges • Barometers • Switches • Pen Recorders • Data Loggers • Oxygen Service Gauges • Altimeters • Calibrators • Air Gauges • Transducers • Transmitters • Recorders (0 ~ 30) psi (>30 ~ 250) psi (>250 ~ 500) psi (>500 ~ 750) psi (>750 ~ 1000) psi (>1000 ~ 1250) psi (>1250 ~ 1600) psi	CTTM-M07-2007, Rev. 08	0.0062 psi 0.06 psi 0.11 psi 0.16 psi 0.21 psi 0.26 psi 0.33 psi

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A6 Oxygen Service /Oil free Pressure Ranges (Lab/Site) • Oxygen Service Gauges • Air Gauges • Air Test Sets • Data Loggers • Calibrators • Switches • Barfield Test Sets • High Pressure Gas Gauges • Manometers • Pen Recorders • Digital Indicators (0 ~ 2000) psi (>2000 ~ 8000) psi (>8000 ~ 10000) psi	CTTM-M09-2007, Rev. 09	1 psi 1 psi 3 psi
A7 Pressure Force Gauge (Lab / Site) • Pressure Force Gauges • Load Gauges • Tonne Gauges • Hydraulic Gauges • Mud Gauges • Crane Gauges • Metric Gauges (0 ~ 30) psi (>30 ~ 250) psi (>250 ~ 500) psi (>500 ~ 800) psi (>800 ~ 1500) psi	CTTM-M07-2007, Rev. 08	0.0062 psi 0.06 psi 0.11 psi 0.17 psi 0.31 psi

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(0 ~ 100) psi (>100 ~ 200) psi (>200 ~ 400) psi (>400 ~ 600) psi (>600 ~ 800) psi (>800 ~ 1000) psi (>1000 ~ 2000) psi (>2000 ~ 4000) psi (>4000 ~ 6000) psi (>6000 ~ 8000) psi (>8000 ~ 12000) psi (>12000 ~ 16000) psi A10 High Pressure Ranges (Lab/Site) • Pen Recorders • High Pressure Gauges • Pressure Transducers • Pressure Transmitters • Mud Gauges • Data Loggers • Pressure Switches	CTTM-M09-2007, Rev. 09	0.03 psi 0.05 psi 0.09 psi 0.13 psi 0.17 psi 0.21 psi 0.5 psi 0.9 psi 1.3 psi 2 psi 3 psi 4 psi
(0 ~ 30000) psi A11 Ultra High Pressure Ranges (Lab/Site) • Pen Recorders • High Pressure Gauges • Pressure Transducers • Pressure Transmitters • Mud Gauges • Data Loggers • Pressure Switches	CTTM-M10-2007, Rev. 07	40 psi
(0 ~ 60000) psi (>60000 ~ 72000) psi	CTTM-M11-2007, Rev. 07	150 psi 1500 psi

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A12 Pneumatic Dead Weight Tester- Cross Float, Verification (Lab) Pneumatic DWT (10 ~ 50) psi (>50 ~ 160) psi (>160 ~ 320) psi (>320 ~ 640) psi (>640 ~ 960) psi (>960 ~ 1280) psi (>1280 ~ 1600) psi	CTTM-M07-2007, Rev. 08	0.011 psi 0.033 psi 0.066 psi 0.14 psi 0.20 psi 0.27 psi 0.33 psi
A13 Hydraulic Dead Weight Tester- Cross Float, Verification (Lab) Hydraulic DWT (10 ~ 80) psi (>80 ~ 160) psi (>160 ~ 320) psi (>320 ~ 480) psi (>480 ~ 640) psi (>640 ~ 800) psi (>800 ~ 1600) psi (>1600 ~ 3200) psi (>3200 ~ 6400) psi (>6400 ~ 9600) psi (>9600 ~ 12000) psi (>12000 ~ 16000) psi	CTTM-M09-2007, Rev. 09	0.017 psi 0.033 psi 0.066 psi 0.099 psi 0.14 psi 0.17 psi 0.33 psi 0.66 psi 1.4 psi 2.0 psi 2.5 psi 3.3 psi

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A14 High Vacuum Ranges (Lab/Site) - Pirani Gauge - Hot Cathode Gauge - Thermistor Gauge - Torr Meter - Micron Gauge $(1.0 \times 10^{-6} \sim 5.0 \times 10^{-5})$ Torr $(5.0 \times 10^{-5} \sim 8.0 \times 10^{-5})$ Torr $(>8.0 \times 10^{-5} \sim 2.0 \times 10^{-4})$ Torr $(>2.0 \times 10^{-4} \sim 2.0 \times 10^{-3})$ Torr $(>2.0 \times 10^{-3} \sim 6.0 \times 10^{-3})$ Torr $(>6.0 \times 10^{-3} \sim 1.0 \times 10^{-2})$ Torr $(>1.0 \times 10^{-2} \sim 8.0 \times 10^{-2})$ Torr $(>8.0 \times 10^{-2} \sim 1.0 \times 10^{-1})$ Torr $(>0.1 \sim 0.8)$ Torr $(>0.8 \sim 4.0)$ Torr $(>4.0 \sim 10.0)$ Torr	CTTM-M05-2007, Rev. 07	1.5E-05 Torr 1.4E-05 Torr 3.7E-05 Torr 1.1E-04 Torr 2.6E-04 Torr 3.8E-04 Torr 2.7E-03 Torr 4.1E-03 Torr 2.7E-02 Torr 1.4E-01 Torr 3.3E-01 Torr
A15 Tachometer Non-Contact (Lab/Site) - Laser Tachometers - Optical Tachometers - Infrared Tachometers - Dial Tachometers - Mechanical Tachometers - Non-contact Tachometers - RPM Meters - Revolution Meters - Speed Indicators / Meters		

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A18 Speed Indicators (Lab/ Site) - Speed Revolution Indicators - Centrifuge - Gear Tachometer (0 ~ 30) rpm (>30 ~ 240) rpm (>240 ~ 600) rpm (>600 ~ 1200) rpm (>1200 ~ 3000) rpm (>3000 ~ 6000) rpm (>6000 ~ 15000) rpm (>15000 ~ 30000) rpm	CTTM-M17-2007, Rev. 07	5.1E-01 % of full scale 8.4E-02 % of full scale 5.6E-02 % of full scale 6.9E-02 % of full scale 5.5E-02 % of full scale 5.1E-02 % of full scale 6.2E-02 % of full scale 5.4E-02 % of full scale
A19 Balance and Weighing Scales (Lab/Site) Top-loading, Direct-reading, Scales and Balances (0 ~ 1) g (0 ~ 80) g (0 ~ 220) g (0 ~ 300) g (0 ~ 6000) g (0 ~ 10) kg (0 ~ 22) kg (0 ~ 30) kg (0 ~ 100) kg (0 ~ 300) kg (0 ~ 1000) kg	CTTM-M18-2007, Rev. 06	0.00012 g 0.00015 g 0.0002 g 0.0003 g 0.03 g 0.0001 kg 0.0001 kg 0.01 kg 0.01 kg 0.01 kg 0.1 kg
A20 Non-Standard Mass (Lab) (Excluding OIML R111 and ANSI/ASTM E716 Class of Mass)		

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
(1 to 1000) mg (>1 to 50) g (>50 to 80) g (>80 to 220) g (>220 to 300) g (>300 to 1000) g (>1000 to 6000) g (>6 to 10) kg (>10 to 20) kg (>20 to 30) kg A21 Mass (Lab) Working Class Mass (OIML R111 Class F1 and lower and equivalent classes in ANSI/ASTM E716)	CTTM-M13-2008, Rev. 07	0.04 mg 0.11 mg 0.11 mg 0.3 mg 0.3 mg 0.02 g 0.02 g 0.0001 kg 0.0001 kg 0.01 kg
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	CTTM-M13-2008, Rev. 07	0.01 mg 0.01 mg 0.01 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.03 mg 0.04 mg 0.00004 g 0.00005 g 0.00006 g 0.00008 g 0.00010 g 0.00012 g 0.0002 g 0.0004 g 0.01 g 0.01 g 0.01 g 0.02 g 0.0001 kg 0.0001 kg

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A22 Volume Measuring Instrument (Lab)		
Burettes (1 ~ 200) ml (>200 ~ 300) ml	CTTM-M12-2008, Rev. 09	0.0005 ml 0.0015 ml
Pipettes (1 ~ 500) µl (>500 ~ 1000) µl (>1 ~ 50) ml	CTTM-M12-2008, Rev. 09	0.20 µl 0.20 µl 0.00026 ml
Volumetric Flasks and Cylinders (1 ~ 200) ml (>200 ~ 300) ml (>300 ~ 6000) ml (>6 ~ 22) L (>22 ~ 30) L (>30 ~ 100) L	CTTM-M12-2008, Rev. 09	0.0005 ml 0.0015 ml 0.06ml 0.0013 L 0.02 L 0.1 L
Syringe (1 – 500) µl (>500 – 1000) µl (>1 – 200) ml (>200 – 300) ml >300 ml – 1 L (>1 – 5) L	CTTM-M12-2008, Rev. 09	0.20 µl 0.20 µl 0.0005 ml 0.0015 ml 0.06 ml 0.06 ml
Dispenser (100 – 500) µl (>500 – 1000) µl (>1 – 200) ml (>200 – 300) ml	CTTM-M12-2008, Rev. 09	0.20 µl 0.20 µl 0.0005 ml 0.0015 ml

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A23 Density Measuring Instruments (Lab) - S.G Hydrometer - API Gravity - Bulb Hydrometer - Glass Hydrometer (0.65 – 1.95) g/cm³	CTTM-M20-2008, Rev. 04	0.00011 g/cm ³
A24 Vibration/Acceleration Measuring Instruments (Lab/Site) Acceleration Measurement (without sensitivity) (0 ~ 10) m/s² at 40 Hz (0 ~ 10) m/s² at 80 Hz (0 ~ 10) m/s² at 160 Hz (0 ~ 10) m/s² at 315 Hz (0 ~ 10) m/s² at 630 Hz (0 ~ 10) m/s² at 1.25 kHz (0 ~ 10) m/s² at 2.5 kHz (0 ~ 10) m/s² at 5 kHz Velocity Measurement (without sensitivity) (0 ~ 40) mm/s at 40 Hz (0 ~ 20) mm/s at 80 Hz (0 ~ 5) mm/s at 315 Hz	CTTM-M15-2008, Rev. 04 CTTM – M15 – 2008, Rev. 04	0.48 m/s² 0.49 m/s² 0.49 m/s² 0.48 m/s² 0.49 m/s² 0.50 m/s² 1.2 m/s² 1.2 m/s² 1.8 mm/s 0.65 mm/s 0.17 mm/s

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A27 a) Torque measuring Devices (Lab) Indicating Torque Wrench and Driver Setting Toque Wrench and Driver $\leq 0.5 \text{ N}\cdot\text{m}$ $(0.5 \text{ to } 1.5) \text{ N}\cdot\text{m}$ $(> 1.5 \text{ to } 6.0) \text{ N}\cdot\text{m}$ $(> 6.0 \text{ to } 30.0) \text{ N}\cdot\text{m}$ $(> 30.0 \text{ to } 60.0) \text{ N}\cdot\text{m}$ $(> 60.0 \text{ to } 100.0) \text{ N}\cdot\text{m}$ $(> 100.0 \text{ to } 300.0) \text{ N}\cdot\text{m}$ $(> 300.0 \text{ to } 850.0) \text{ N}\cdot\text{m}$ $(> 850.0 \text{ to } 1400.0) \text{ N}\cdot\text{m}$ $(> 1400.0 \text{ to } 2000.0) \text{ N}\cdot\text{m}$ b) Torque measuring Devices (Lab) Indicating Torque Wrench and Driver Setting Toque Wrench and Driver $(\geq 0.4 \text{ to } 2) \text{ N}\cdot\text{m}$ $(>2 \text{ to } \leq 25) \text{ N}\cdot\text{m}$ $(>25 \text{ to } \leq 400) \text{ N}\cdot\text{m}$ $(>400 \text{ to } \leq 1500) \text{ N}\cdot\text{m}$	(As Per ISO 6789:2003E) CTTM – M08 – 2013, Rev. 03 CTTM – M08 – 2013, Rev. 03	$0.018 \text{ N}\cdot\text{m}$ $0.030 \text{ N}\cdot\text{m}$ $0.078 \text{ N}\cdot\text{m}$ $0.13 \text{ N}\cdot\text{m}$ $0.20 \text{ N}\cdot\text{m}$ $0.38 \text{ N}\cdot\text{m}$ $2.0 \text{ N}\cdot\text{m}$ $5.5 \text{ N}\cdot\text{m}$ $9.1 \text{ N}\cdot\text{m}$ $17 \text{ N}\cdot\text{m}$
A28 Sound Pressure Level Devices (Lab & Site) Sound Level Meters and Noise Analysers $94 \text{ dB @ } 1000 \text{ Hz}$ $114 \text{ dB @ } 1000 \text{ Hz}$	(As Per ISO 6789:2017E) CTTM - M08 – 2013, Rev. 03 CTTM - M16 – 2007, Rev.05	$0.47 \% \text{ of reading}$ $0.46 \% \text{ of reading}$ $0.32 \% \text{ of reading}$ $0.71 \% \text{ of reading}$ 0.3 dB 0.4 dB

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A29 Gas Flow Meters (Lab & Site) - Gas Flow Meters - Thermal mass Flow Meter - Airflow Sampler - Rota Meter (0 ~ 300) mlpm (>0.3 ~ 0.5) lpm (>0.5 ~ 50) lpm (>50 ~ 100) lpm (>100 ~ 500) lpm (>500 ~ 650) lpm	CTTM – M21 – 2007, Rev.06	0.96 % of reading 1.3 % of reading 0.6 % of reading 2.5 % of reading 1.3 % of reading 0.9 % of reading
A30 (a) Liquid Flow Meters (Lab*) - Mass flow meters - Coriolis meters - Rota meters - Magnetic flow meters - Turbine flow meters - Ultrasonic flow meters - PD meters - Vortex meters Mass Flow Rate / Quantities (0.0 to 420) kg / h (>0.2 to 0.8) Mt / h (> 0.8 to 5.0) Mt / h (> 5.0 to 200) Mt / h (> 200 to 280) Mt / h Volume Flow Rate / Quantities (0.0 to 420) l / h (>0.2 to 0.8) m3 / h (> 0.8 to 5.0) m3 / h (> 5.0 to 200) m3 / h (>200 to 280) m3 / h	CTTM – M22 – 2007 Part 1, Rev 09	0.79 % 0.15 % 0.09 % 0.09 % 0.15 % 0.79 % 0.18 % 0.14 % 0.13 % 0.19 %

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(b) Liquid Flow Meters (Site) • Mass flow meters • Rota meters • Magnetic flow meters • Turbine flow meters • Ultrasonic flow meters • PD meters • Vortex meters Mass Flow Rate (>0.4 to 0.8) Mt / h (> 0.8 to 5.0) Mt / h (> 5.0 to 200) Mt / h (> 200 to 280) Mt / h Volume Flow Rate (>0.4 to 0.8) m ³ / h (> 0.8 to 5.0) m ³ / h (> 5.0 to 200) m ³ / h (>200 to 280) m ³ / h	CTTM – M22 – 2007 Part 2, Rev 08	2.4 % to 1.6 % 1.2 % 1.2 % 1.2 % 1.2 % 1.2 % 1.2 % 1.2 %
(c) Oil Flow Meters (Lab / Site) (> 66 to 500) LPM	CTTM – M22 – 2007 Part 3, Rev 00 [For Meter Factor]	1.8 %
A31 Air Volume meters (Lab) • Balometer • Airflow meter • Air Data Multimeter • Velometer Volumetric Flow Rate (500 to 1000) m ³ / h (>1000 to 1500) m ³ / h (>1500 to 2500) m ³ / h (>2500 to 3300) m ³ / h	CTTM – M34 – 2007, Rev.04	1.5 % of reading 1.4 % of reading 0.69 % of reading 0.86 % of reading

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
A32 Air Velocity Meters (Lab/Site) - Hot-wire Anemometer - Air Velocity Meter - Vane Anemometer - Cup Anemometer - Anemometer Air Speed (0.3 to 0.5) m / s (>0.5.0 to 1.0) m / s (>1.0 to 10.0) m / s (>10.0 to 25.0) m / s	CTTM – M19 – 2007, Rev.05	0.29 m/s 0.17 m/s 0.10 m/s 0.58 m/s
A33 Torque Meter Tester (Lab & Site) - Torque Checker - Torque Analyzer - Torque Tester - Digital Torque Meter - Torque Transducer - Torque Indicator Up to 5 N.m Up to 10 N.m	CTTM – M24 – 2024, Rev.00	0.00059 N.m 0.0058 N.m
A34 Torque Multiplier (Lab) Up to 1200 lbf. ft Up to 3200 lbf. ft Up to 5000 lbf. ft	CTTM – M25 – 2024, Rev.00	6.9 lbf. ft 24 lbf. ft 30 lbf. ft

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A35 Hydraulic Torque Wrench (Lab) Up to 418 N.m Up to 1300 N.m Up to 2070 N.m Up to 4086 N.m Up to 5002 N.m Up to 6092 N.m Up to 10000 N.m Up to 15000 N.m Up to 20000 N.m Up to 25000 N.m Up to 30000 N.m Up to 50000 N.m	CTTM – M38 – 2024, Rev.00	2.6 N.m 4.8 N.m 9.4 N.m 20 N.m 20 N.m 24 N.m 100 N.m 147 N.m 191 N.m 228 N.m 268 N.m 310 N.m
A36 Rubber Hardness Tester (Lab & Site) Shore A, B, E & O • Hand Durometer • Pencil Durometer • Digital Durometer • Tire Hardness Gauge • Pocket Durometer • Pocket Durometer • Dial Durometer Direct Force Verification Up to 75 Div. (855 gf)	CTTM – M35 – 2024, Rev.00	8.7 mN

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B. Electrical DC/LF		
B1 DC Voltage Measuring Instruments (Lab/Site)	CTTM – E01 – 2007, Rev. 08	
0 mV ~ 329.9999 mV		9.4 μ V
330 mV ~ 3.299999 V		47 μ V
3.3 V ~ 32.99999 V		0.52 mV
33V ~ 329.9999 V		7.3 mV
330 V ~1020 V		25 mV
B2 DC High Voltage Measuring Instruments (Lab/ Site)	CTTM – E01 – 2007, Rev. 08	
1 kV ~ 5 kV		0.16 kV
5 kV ~ 10 kV		0.26 kV
10 kV ~ 20 kV		0.66 kV
20 kV ~ 30 kV		0.84 kV
30 kV ~ 40 kV		1.0 kV
40 kV ~ 50 kV		1.2 kV
50 kV ~ 60 kV		1.8 kV
60 kV ~ 70 kV		2.0 kV
B3 DC Current Measuring Instruments (Lab/Site)		
0 μ A ~ 329.999 μ A	CTTM – E01 – 2007, Rev. 08	0.062 μ A
0.33 mA ~ 3.299999 mA		0.45 μ A
3.3 mA ~ 32.99999 mA		4.2 μ A
33.0 mA ~ 329.999 mA		41 μ A
0.33 A ~ 1.099999 A		0.30 mA
1.1 A ~ 2.999999 A		1.4 mA
3.0 A ~ 10.9999 A		7.0 mA
11 A ~ 16.499 A	CTTM – E04 – 2007, Rev. 06	0.28 A
16.5 A ~ 109.49 A		0.95 A
109.5 A ~149.99 A		1.6 A
150 A ~ 549.99 A		4.2 A
550 A ~ 1000 A		7.5 A

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B4 AC Voltage Measuring Instruments (Lab/Site) <u>1 mV ~ 32.999 mV</u> 10 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz 100 kHz ~ 450 kHz <u>33 mV ~ 329.999 mV</u> 10 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz 100 kHz ~ 450 kHz <u>0.33 V ~ 3.29999 V</u> 10 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz 100 kHz ~ 450 kHz <u>3.3 V ~ 32.9999 V</u> 10 Hz ~ 45 Hz 45 Hz ~ 10 kHz 10 kHz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz <u>33 V ~ 329.999 V</u> 45 Hz ~ 1 kHz 1 kHz ~ 10 kHz 10 kHz ~ 20 kHz	CTTM – E01 – 2007, Rev. 08	22 µV 16 µV 19 µV 21 µV 27 µV 80 µV 0.17 mV 0.13 mV 65 µV 66 µV 72 µV 0.15 mV 0.35 mV 0.85 mV 2.0 mV 1.3 mV 1.3 mV 1.7 mV 2.1 mV 5.3 mV 5.3 mV 42 mV 15 mV 17 mV 30 mV 30 mV 130 mV 130 mV 140 mV

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<u>330 V ~ 1000 V</u> 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz 1 kV ~ 5 kV @ 50 Hz 5 kV ~ 10 kV @ 50 Hz 10 kV ~ 20 kV @ 50 Hz 20 kV ~ 30 kV @ 50 Hz 30 kV ~ 40 kV @ 50 Hz 40 kV ~ 50 kV @ 50 Hz 50 kV ~ 60 kV @ 50 Hz 60 kV ~ 70 kV @ 50 Hz	CTTM – E01 – 2007, Rev. 08	0.37 V 0.37 V 0.37 V 0.14 kV 0.25 kV 0.57 kV 0.77 kV 0.98 kV 1.2 kV 1.7 kV 1.9 kV
B5 AC Current Measuring Instruments (Lab/Site) <u>29.00 µA ~ 329.99 µA</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz <u>0.33 mA ~ 3.2999 mA</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz <u>3.3 mA ~ 32.9999 mA</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz		8.4 µA 8.4 µA 8.5 µA 22 µA 88 µA 88 µA 88 µA 90 µA 39 µA 22 µA 36 µA 81 µA

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<u>33 mA ~ 329.999 mA</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz <u>0.33 A ~ 1.09999 A</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz <u>1.1 A ~ 2.99999 A</u> 20 Hz ~ 45 Hz 45 Hz ~ 1 kHz 1 kHz ~ 5 kHz 5 kHz ~ 10 kHz <u>2.2 A ~ 10.999 A</u> 45 Hz ~ 100 Hz 100 Hz ~ 1 kHz 1 kHz ~ 5 kHz <u>11 A ~ 20.5 A</u> 45 Hz ~ 100 Hz 100 Hz ~ 1 kHz 1 kHz ~ 5 kHz		0.37 mA 0.18 mA 0.44 mA 0.88 mA 43 mA 48 mA 94 mA 47 mA 15 mA 13 mA 26 mA 94 mA 10 mA 15 mA 390 mA 35 mA 42 mA 0.72 A

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
11 A ~ 16.499 A @ 50 Hz 16.5 A ~ 109.99 A @ 50 Hz 110 A ~ 149.99 A @ 50 Hz 150 A ~ 549.99 A @ 50 Hz 550 A ~ 1000 A @ 50 Hz	CTTM – E04 – 2007, Rev. 06 (Toroidal Type Clamp)	0.21 A 0.55 A 0.71 A 2.6 A 7.5 A
11 A ~ 16.499 A @ 400 Hz 16.5 A ~ 109.99 A @ 400 Hz 110 A ~ 149.99 A @ 400 Hz 150 A ~ 549.99 A @ 400 Hz 550 A ~ 1000 A @ 400 Hz	CTTM – E04 – 2007, Rev. 06 (Toroidal Type Clamp)	0.26 A 1.2 A 1.6 A 5.5 A 12 A
11 A ~ 16.499 A @ 50 Hz 16.5 A ~ 109.99 A @ 50 Hz 110 A ~ 149.99 A @ 50 Hz 150 A ~ 549.99 A @ 50 Hz 550 A ~ 1000 A @ 50 Hz	CTTM – E04 – 2007, Rev. 06 (Non-Toroidal Type Clamp)	0.25 A 1.1 A 1.4 A 4.9 A 11 A
10.1 A ~ 16.499 A @ 400 Hz 16.5 A ~ 109.99 A @ 400 Hz 110 A ~ 149.99 A @ 400 Hz 150 A ~ 550 A @ 400 Hz 550 A ~ 1000 A @ 400 Hz	CTTM – E04 – 2007, Rev. 06 (Non-Toroidal Type Clamp)	0.31 A 1.7 A 2.1 A 8.8 A 15 A

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B6 Capacitance Measuring Instruments (Lab/Site) 35.00 pF ~ 50.00 pF @ 1 kHz 50.00 pF ~ 70.00 pF @ 1 kHz 70.00 pF ~ 145.00 pF @ 1 kHz 100.00 pF ~ 200.00 pF @ 1 kHz 200.00 pF ~ 1155.0 pF @ 1 kHz 0.19 nF ~ 0.3999 nF @ 1 kHz 0.4 nF ~ 1.0999 nF @ 1 kHz 1.1 nF ~ 3.2999 nF @ 1 kHz 3.3 nF ~ 10.9999 nF @ 1 kHz 11 nF ~ 32.9999 nF @ 1 kHz 33 nF ~ 109.999 nF @ 1 kHz 110 nF ~ 329.999 nF @ 1 kHz 0.33 µF ~ 1.09999 µF @ 100 Hz 1.1 µF ~ 3.29999 µF @ 100 Hz 3.3 µF ~ 10.9999 µF @ 100 Hz 11 µF ~ 32.9999 µF @ 100 Hz 33 µF ~ 109.999 µF @ 50 Hz 110 µF ~ 329.999 µF @ 50 Hz 0.33 mF ~ 1.09999 mF DC 1.1 mF ~ 3.29999 mF DC 3.3 mF ~ 10.9999 mF DC 11 mF ~ 32.9999 mF DC 33 mF ~ 110 mF DC	CTTM – E03 – 2007, Rev. 07	7.4% of reading 5.2% of reading 2.3% of reading 7.7 pF 7.8 pF 14 pF 18 pF 32 pF 45 pF 0.23 nF 0.44 nF 1.3 nF 4.6 nF 16 nF 44 nF 0.20 µF 0.70 µF 2.2 µF 7.0 µF 19 µF 58 µF 300 µF 1.4 mF

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
B7 Milliohm Resistance Measuring Instruments (Lab/Site) 1 mΩ 2 mΩ 5 mΩ 0.001 Ω ~ 0.01 Ω 0.01Ω ~ 0.1 Ω 0.1 Ω ~ 1 Ω 1 Ω ~ 10 Ω 10 Ω ~ 100 Ω 100 Ω ~ 1 kΩ	CTTM – E12 – 2007, Rev. 05	7.0 μΩ 0.60 μΩ 0.67 μΩ 5.9 % of reading 2.4 % of reading 0.14 % of reading 0.059 % of reading 0.015 % of reading 0.014 % of reading
B8 Resistance Measuring Instruments (Lab/Site) 0 Ω ~ 10.999 Ω 11 Ω ~ 32.9999 Ω 33 Ω ~ 109.9999 Ω 110 Ω ~ 329.9999 Ω 330 Ω ~ 1.099999 kΩ 1.1 kΩ ~ 3.299999 kΩ 3.3 kΩ ~ 10.99999 kΩ 11 kΩ ~ 32.99999 kΩ 33 kΩ ~ 109.9999 kΩ 110 kΩ ~ 329.9999 kΩ 330 kΩ ~ 1.099999 MΩ 1.1 MΩ ~ 3.299999 MΩ 3.3 MΩ ~ 10.99999 MΩ 11 MΩ ~ 32.99999 MΩ 33 MΩ ~ 109.9999 MΩ 110 MΩ ~ 329.9999 MΩ 330 MΩ ~ 1100 MΩ	CTTM – E03 – 2007, Rev. 07	18 mΩ 25 mΩ 27 mΩ 30 mΩ 0.60 Ω 0.72 Ω 0.80 Ω 2.9 Ω 5.7 Ω 30 Ω 0.60 kΩ 0.74 kΩ 2 kΩ 14 kΩ 70 kΩ 1.3 MΩ 20 MΩ

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
0.01 Ω ~ 0.05 Ω 0.05 Ω ~ 0.1 Ω 0.1 Ω ~ 0.5 Ω 0.5 Ω ~ 1.0 Ω 1.0 Ω ~ 5.0 Ω 5.0 Ω ~ 10.0 Ω 10.0 Ω ~ 50.0 Ω 50.0 Ω ~ 100.0 Ω 100.0 Ω ~ 500.0 Ω 500.0 Ω ~ 1000.0 Ω 1.0 k Ω ~ 5.0 k Ω 5.0 k Ω ~ 10.0 k Ω 10.0 k Ω ~ 50.0 k Ω 50.0 k Ω ~ 100.0 k Ω	CTTM – E03 – 2007, Rev. 07	2.9 m Ω 5.8 m Ω 12 m Ω 24 m Ω 29 m Ω 58 m Ω 59 m Ω 120 m Ω 580 m Ω 1.2 Ω 5.8 Ω 12 Ω 58 Ω 120 Ω
B9 High Voltage Resistance Measuring Instruments (Lab / Site) 100 k Ω 1000 k Ω 10 M Ω 100 M Ω 1000 M Ω 10 G Ω 100 G Ω 1000 G Ω 2 T Ω 3 T Ω 4 T Ω 5 T Ω 6 T Ω 7 T Ω 8 T Ω 9 T Ω 10 T Ω	CTTM – E11 – 2007, Rev. 06	140 Ω 1.4 k Ω 120 k Ω 1.7 M Ω 12 M Ω 0.13 G Ω 3.5 G Ω 45 G Ω 0.10 T Ω 0.14 T Ω 0.18 T Ω 0.22 T Ω 0.27 T Ω 0.33 T Ω 0.38 T Ω 0.41 T Ω 0.53 T Ω

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B10 Resistance Sourcing Instruments (Lab/Site) 0 Ω ~ 10 Ω 10 Ω ~ 100 Ω 100 Ω ~ 1 k Ω 1 k Ω ~ 10 k Ω 10 k Ω ~ 100 k Ω 100 k Ω ~ 1 M Ω 1 M Ω ~ 10 M Ω 10 M Ω ~ 100 M Ω 100 M Ω ~ 1 G Ω	CTTM – E06 – 2007, Rev. 06	0.0047 Ω 0.017 Ω 0.13 Ω 1.3 Ω 13 Ω 0.15 k Ω 4.8 k Ω 0.94 M Ω 24 M Ω
B11 Frequency Measuring Instruments (Lab/Site) 0.010 Hz ~ 119.990 Hz 120.0 Hz ~ 1199.9 Hz 1.200 kHz ~ 11.999 kHz 12.00 kHz ~ 119.99 kHz 120.0 kHz ~ 1199.9 kHz 1200.0kHz ~ 2000.0 kHz	CTTM – E01 – 2007, Rev. 08	8 mHz 0.2 Hz 0.14 Hz 5.5 Hz 3.5 Hz 58 Hz
B12 Frequency Sourcing Instruments (Lab/Site) 3 Hz ~ 5 Hz 5 Hz ~ 10 Hz 10 Hz ~ 40 Hz 40 Hz ~ 1 kHz 1 kHz ~ 300 kHz 300 kHz ~ 1 MHz	CTTM – E06 – 2007, Rev. 06	0.17 % of reading 0.15 % of reading 0.038 % of reading 0.013 % of reading 0.023 % of reading 0.013 % of reading

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B13 DC Voltage Sourcing Instruments (Lab/Site) 0.0 mV ~ 100 mV 0.1 V ~ 1 V 1 V ~ 10 V 10 V ~ 100 V 100 V ~ 1000 V DC High Voltage Sourcing Instruments (Lab/Site) ~10 kV 10 kV ~ 20 kV 20 kV ~ 50 kV 50 kV ~ 100 kV	CTTM – E06 – 2007, Rev. 06 CTTM – E07 – 2007, Rev. 07	8.7 µV 39 µV 340 µV 5.2 mV 60 mV 0.090 kV 0.12 kV 0.35 kV 0.74 kV
B14 DC Current Sourcing Instruments (Lab/Site) 0 µA ~ 100 µA 100 µA ~ 1 mA 1 mA ~ 10 mA 10 mA ~ 100 mA 100 mA ~ 1 A 1 A ~ 3 A 2 A ~ 10 A DC High Current Sourcing Instruments (Lab/Site) 0.0 A ~ 30.0 A 30.0 A ~ 100 A 101 A ~ 250 A 251 A ~ 500 A 501 A ~ 750 A 751 A ~ 900 A	CTTM – E06 – 2007, Rev. 06 CTTM – E09 – 2007, Rev. 06 Reference: Clamp meter	88 nA 640 nA 8.2 µA 64 µA 830 µA 4.2 mA 19 mA 1.8 A 3.2 A 7.7 A 13 A 20 A 23 A

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
DC High Current Sourcing Instruments (Lab/Site) 0.0 A ~ 30.0 A 30.0 A ~ 100 A 101 A ~ 250 A 251 A ~ 500 A 501 A ~ 750 A 751 A ~ 900 A	CTTM – E09 – 2007, Rev. 06 Reference: Clamp meter	1.8 A 3.2 A 7.7 A 13 A 20 A 23 A
DC High Current Sourcing Instruments (Lab/Site) 0.0 A ~ 30.0 A 30.0 A ~ 50 A 50 A ~ 100 A 100 A ~ 200 A 200 A ~ 300 A 300 A ~ 400 A 400 A ~ 500 A	CTTM – E09 – 2007, Rev. 06 Reference: Current Shunt	50 mA 76 mA 0.25 A 0.64 A 0.92 A 1.3 A 1.6 A
B15 AC Current Sourcing Instruments (Lab/Site) 1 μA ~ 100 μA 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz 100 μA ~ 1 mA 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz 1 mA ~ 10 mA 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz 10 mA ~ 100 mA 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz	CTTM – E06 – 2007, Rev. 06	0.17 μ A 0.52 μ A 1.7 μ A 5.3 μ A 17 μ A 52 μ A 170 μ A 530 μ A

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100 mA ~ 1 A 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz 1 A ~ 3 A 10 Hz ~ 5 kHz 5 kHz ~ 10 kHz 3 A ~ 10 A 10 Hz ~ 1 kHz 0.0 A ~ 100 A 101 A ~ 250 A 251 A ~ 500 A 501 A ~ 750 A 751 A ~ 900 A	CTTM – E09 – 2007, Rev. 06	1.7 mA 13 mA 7.3 mA 37 mA 25 mA 3.0 A 6.9 A 13 A 20 A 24 A
B16 AC Voltage Sourcing Instruments (Lab/Site) 1 mV ~ 100 mV 5 Hz ~ 10 Hz 10 Hz ~ 20 k Hz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz 100 kHz ~ 300 kHz 100 mV ~ 1.0 V 5 Hz ~ 10 Hz 10 Hz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz 100 kHz ~ 300 kHz 1.0 V ~ 10 V 5 Hz ~ 10 Hz 10 Hz ~ 20 kHz 20 kHz ~ 50 kHz 50 kHz ~ 100 kHz	CTTM – E06 – 2007, Rev. 06	0.46 mV 0.12 mV 0.2 mV 5.4 mV 5.3 mV 4.4 mV 1.1 mV 2.0 mV 52 mV 52 mV 44 mV 11 mV 20 mV 79 mV

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10 V ~ 100 V 10 Hz ~ 20 kHz 100 V ~ 1000 V 10 Hz ~ 20 kHz 1 kV ~10 kV @ 50 Hz 10 kV ~ 20 kV @ 50 Hz 20 kV ~ 50 kV @ 50 Hz 50 kV ~ 100 kV @ 50 Hz	CTTM – E07 – 2007, Rev. 07	110 mV 1.1 V 0.043 kV 0.079 kV 0.32 kV 0.39 kV
B17 Inductance Measuring Instruments (Lab/Site) 0.01 mH ~ 0.1 mH @ 1kHz 0.1 mH ~1 mH @ 1kHz 1 mH ~ 10 mH @ 1kHz 10 mH ~ 100 mH @ 1kHz 100 mH ~ 1000 mH @ 1kHz 1 H ~ 5 H @ 1kHz 5 H ~ 10 H @ 1kHz	CTTM – E03 – 2007, Rev. 07	1.2 % of reading 2.4 % of reading 2.4 % of reading 2.4 % of reading 2.4 % of reading 2.5 % of reading 3.0 % of reading
B18 Time Measuring Instruments (Lab/Site) 1 s ~ 59 s 1 min ~ 59 mins 60 mins ~ 180 mins 180 min ~ 8 Hrs 8 Hrs ~ 12 Hrs 12 Hrs ~ 24 Hrs 1 s ~ 59 s 1 min ~ 59 mins 60 mins ~ 180 mins 180 min ~ 8 Hrs 8 Hrs ~ 12 Hrs 12 Hrs ~ 24 Hrs	CTTM – E13 – 2007, Rev. 04 Ref: Universal Counter Ref: Stopwatch	0.057 s 0.057 s 0.084 s 0.34 s 0.78 s 1.2 s 0.59 s 0.66 s 1.1 s 2.5 s 3.8 s 7.3 s

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B19 Power Measuring Instruments DC Power (Lab/Site) 0.1 kW ~ 10 kW 10 kW ~16.499 kW 16.5 kW ~ 149.999 kW 149.999 kW ~ 549.999 kW 550.000 kW ~ 1000 kW	CTTM – E02 – 2007, Rev. 05	0.48 % of reading 0.41 % of reading 0.32 % of reading 0.32 % of reading 0.32 % of reading
B20 Power Measuring Instruments AC Power (Lab/Site) 0.1 kW ~ 10 kW 10 kW ~ 16.499 kW 16.5 kW ~ 149.999 kW 149.999 kW ~ 549.999 kW 550.000 kW ~ 1000 kW	CTTM – E02 – 2007, Rev. 05 45 Hz ~ 50 Hz @ PF = 1	1.1% of reading 0.81 % of reading 0.39 % of reading 0.38 % of reading 0.38 % of reading
B21 Capacitance Sourcing Instruments (Lab/Site) 0.1 nF ~ 1 nF @1kHz 1 nF ~ 10 nF @1kHz 10 nF ~ 100 nF @1kHz 100 nF ~ 1 µF @1kHz 1 µF ~ 10 µF @1kHz 10 µF ~ 100 µF @1kHz 100 µF ~ 1 mF @1kHz	CTTM – E06 – 2007, Rev. 06	5.4 % of reading 1.8 % of reading 1.8 % of reading 1.8 % of reading 1.8 % of reading 1.8 % of reading 1.8 % of reading
B22 Electrostatic Voltmeter Measuring Instruments (Lab) 1.00 kV ~ 10.00 kV	CTTM-E15:2011, Rev. 04	0.46 kV

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C. Temperature		
C1 Ice Point of Water / Fixed Point Cells (Lab)	CTTM – T01 – 2007, Rev. 06	
Ice Point of Water @ 0 °C		0.019 °C
RTD/PRT Sensor with Indicator		0.062 °C
RTD/PRT Sensor without Indicator		
Triple Point of Water (0.01 °C)		3 mK
Gallium Melting Point (29.7646 °C)		2 mK
C2 Temperature Measuring Sensors With indicators (Lab)	CTTM – T02 – 2007, Rev. 08	
RTD/PRT Sensor with Indicator		
(-100 to -75) °C		0.14 °C
(-75 to 75) °C		0.024 °C
(75 to 200) °C		0.036 °C
(200 to 300) °C		0.12 °C
(300 to 400) °C		0.12 °C
(400 to 500) °C		0.55 °C
C3 Temperature Measuring Sensors Without indicators (Lab)		
RTD/PRT Sensor without Indicator	CTTM – T02 – 2007, Rev. 08	
(-100 to -75) °C		0.14 °C
(-75 to 75) °C		0.09 °C
(75 to 200) °C		0.10 °C
(200 to 300) °C		0.16 °C
(300 to 400) °C		0.17 °C
(400 to 500) °C		0.58 °C

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C4 Temperature Measuring Sensors With and Without Indicator (Lab) <u>TYPE K (Sensor)</u> (-100 to -75) °C (-75 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE J (Sensor)</u> (-100 to -75) °C (-75 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE R (Sensor)</u> (0 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE S (Sensor)</u> (0 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE E (Sensor)</u> (-100 to -75) °C (-75 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE T (Sensor)</u> (-100 to -75) °C (-75 to 200) °C	CTTM – T02 – 2007, Rev. 08	1.1 °C 1.0 °C 1.3 °C 1.6 °C 1.1 °C 1.0 °C 1.3 °C 1.6 °C 0.60 °C 0.61 °C 0.77 °C 0.60 °C 0.61 °C 0.77 °C 1.1 °C 1.0 °C 1.3 °C 1.6 °C 0.43 °C 0.61 °C

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
<u>TYPE N (Sensor)</u> (-100 to -75) °C (-75 to 200) °C (200 to 400) °C (400 to 500) °C <u>TYPE B (Sensor)</u> (0 to 200) °C (200 to 400) °C (400 to 500) °C Temperature Measuring Sensors With and Without Indicator (Lab) <u>TYPE K (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C <u>TYPE J (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C <u>TYPE N (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C <u>TYPE R (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C	CTTM – T03 – 2007, Rev. 06	1.1 °C 1.0 °C 1.3 °C 1.6 °C 0.80 °C 0.78 °C 0.94 °C 2.4 °C 2.9 °C 3.4 °C 3.9 °C 2.4 °C 2.9 °C 3.4 °C 3.9 °C 2.4 °C 2.9 °C 3.4 °C 3.9 °C 1.6 °C 1.7 °C 1.9 °C 2.0 °C

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
<u>TYPE S (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C <u>TYPE E (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C <u>TYPE B (Sensor)</u> (500 to 600) °C (600 to 800) °C (800 to 1000) °C (1000 to 1200) °C		1.6 °C 1.7 °C 1.9 °C 2.0 °C 2.4 °C 2.9 °C 3.4 °C 1.9 °C 2.3 °C 3.0 °C 3.4 °C
C5 Liquid -In-Glass Thermometers (Lab) (Total Immersion) Graduation = 0.10 °C (-80.0 to 0.0) °C (0.1 to 75.0) °C (75.1 to 100.0) °C (100.1 to 280.0) °C Graduation = 0.50 °C (-80.0 to 0.0) °C (0.1 to 75.0) °C (75.1 to 100.0) °C (100.1 to 280.0) °C	CTTM – T02 – 2007, Rev. 08	0.03 °C 0.02 °C 0.03 °C 0.04 °C 0.06 °C 0.06 °C 0.07 °C 0.07 °C

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MEASURED QUANTITIES/ INSTRUMENT/ RANGE TO BE CALIBRATED	METHOD	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
C6 Liquid -In-Glass Thermometers (Lab) (Partial Immersion) Graduation = 0.1 °C (-80.0 to 0.0) °C (0.1 to 75.0) °C (75.1 to 100.0) °C (100.1 to 280.0) °C Graduation = 0.5 °C (-80.0 to 0.0) °C (0.1 to 75.0) °C (75.1 to 100.0) °C (100.1 to 280.0) °C	CTTM – T02 – 2007, Rev. 08	0.14 °C 0.14 °C 0.14 °C 0.14 °C 0.32 °C 0.32 °C 0.32 °C 0.32 °C
C7 Temperature Calibrators (Lab/Site) Block Calibrators Temperature Baths Furnaces Sand and Liquid Baths Dry Block Calibrators Oil Baths Water Baths -196 °C to -80 °C -80 °C ~ 100 °C 100 °C ~ 300 °C 300 °C ~ 500 °C 500 °C ~ 800 °C 800 °C ~ 1000 °C 1000 °C ~ 1200 °C	CTTM – T04 – 2007, Rev. 05	0.90 °C 0.04 °C 0.06 °C 0.46 °C 1.7 °C 1.8 °C 3.2 °C

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C8 Temperature Radiation Devices (Lab) Emissivity -30 °C ~ 0 °C $\epsilon=0.90$ to 1.00 1.4 °C 0 °C ~ 50 °C $\epsilon=0.90$ to 1.00 3.8 °C 50 °C ~ 100 °C $\epsilon=0.90$ to 1.00 1.6 °C 100 °C ~ 300 °C $\epsilon=0.90$ to 1.00 3.3 °C 300 °C ~ 500 °C $\epsilon=0.90$ to 1.00 4.7 °C 500 °C ~ 600 °C $\epsilon=0.90$ to 1.00 3 °C 600 °C ~ 800 °C $\epsilon=0.90$ to 1.00 3.9 °C 800 °C ~ 1000 °C $\epsilon=0.90$ to 1.00 3.9 °C 1000 °C ~ 1200 °C $\epsilon=0.90$ to 1.00 8.1 °C	CTTM – T05 – 2008, Rev. 05	
C9 Temperature Indicator without Sensor (Lab) Measure Mode: a) Type K -200 °C ~ 0 °C 0 °C ~ 900 °C 900 °C ~ 1370 °C b) Type T -200 °C ~ 0 °C 0 °C ~ 400 °C c) Type J -210 °C ~ 0 °C 0 °C ~ 600 °C 600 °C ~ 1200 °C d) Type N -200 °C ~ 0 °C 0 °C ~ 300 °C 300 °C ~ 1200 °C	CTTM – T06 – 2007, Rev. 05	0.19 °C 0.10 °C 0.11 °C 0.29 °C 0.17 °C 0.09 °C 0.09 °C 0.13 °C 0.11 °C 0.11 °C 0.10 °C

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e) Type R 0 °C ~ 250 °C 250 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.60 °C 0.38 °C 0.35 °C 0.33 °C
f) Type S 0 °C ~ 250 °C 250 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.47 °C 0.36 °C 0.36 °C 0.36 °C
g) Type E -199 °C ~ -100 °C -100 °C ~ 0 °C 0 °C ~ 600 °C 600 °C ~ 1000 °C		0.20 °C 0.11 °C 0.09 °C 0.09 °C
h) RTD Measuring Devices (Indicator) -200 °C ~ -100 °C -100 °C ~ 300 °C 300 °C ~ 600 °C 600 °C ~ 800 °C Temperature Indicator without Sensor (Site) Measure Mode:	CTTM – T06 – 2007, Rev. 05	0.015 °C 0.023 °C 0.023 °C 0.17 °C
a) Type K -200 °C ~ 0 °C 0 °C ~ 900 °C 900 °C ~ 1370 °C		0.12 °C 0.15 °C 0.20 °C

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b) Type T -200 °C ~ 400 °C	CTTM – T06 – 2007, Rev. 05	0.14 °C
c) Type J -210 °C ~ 0 °C 0 °C ~ 1200 °C		0.08 °C 0.09 °C
d) Type N -200 °C ~ 0 °C 0 °C ~ 1200 °C		0.18 °C 0.18 °C
e) Type R 0 °C ~ 100 °C 100 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.94 °C 0.70 °C 0.42 °C 0.37 °C
f) Type S 0 °C ~ 100 °C 100 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.83 °C 0.48 °C 0.48 °C 0.42 °C
g) Type E -199 °C ~ 600 °C 600 °C ~ 1000 °C		0.09 °C 0.11 °C
h) RTD Measuring Devices (Indicator) -200 °C ~ 0 °C 0 °C ~ 300 °C 300 °C ~ 600 °C 600 °C ~ 800 °C		0.03 °C 0.06 °C 0.09 °C 0.10 °C
Thermocouple Sourcing Source Mode: (Lab)		
a) Type K -200 °C ~ 0 °C 0 °C ~ 900 °C 900 °C ~ 1370 °C		0.17 °C 0.16 °C 0.16 °C

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b) Type T -200 °C ~ 0 °C 0 °C ~ 400 °C		0.28 °C 0.28 °C
c) Type J -199 °C ~ 0 °C 0 °C ~ 600 °C 600 °C ~ 1200 °C		0.16 °C 0.10 °C 0.10 °C
d) Type N -200 °C ~ 0 °C 0 °C ~ 400 °C 400 °C ~ 1200 °C		0.24 °C 0.22 °C 0.22 °C
e) Type R 0 °C ~ 250 °C 250 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.19 °C 0.18 °C 0.18 °C 0.23 °C
f) Type S 0 °C ~ 250 °C 250 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.27 °C 0.24 °C 0.24 °C 0.26 °C
g) Type E -199 °C ~ -100 °C -100 °C ~ 600 °C 600 °C ~ 1000 °C		0.28 °C 0.28 °C 0.28 °C
h) RTD Sourcing Devices (Indicator) -200 °C ~ -100 °C -100 °C ~ 0 °C 0 °C ~ 300 °C 300 °C ~ 600 °C 600 °C ~ 800 °C		0.029 °C 0.060 °C 0.10 °C 0.15 °C 0.18 °C

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Thermocouple Sourcing Source Mode: (Site)	CTTM – T06 – 2007, Rev. 05	
a) Type K -200 °C ~ 0 °C 0 °C ~ 900 °C 900 °C ~ 1370 °C		0.12 °C 0.15 °C 0.20 °C
b) Type T -200 °C ~ 400 °C		0.14 °C
c) Type J -210 °C ~ 0 °C 0 °C ~ 1200 °C		0.08 °C 0.09 °C
d) Type N -200 °C ~ 0 °C 0 °C ~ 1200 °C		0.18 °C 0.18 °C
e) Type R 0 °C ~ 100 °C 100 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.94 °C 0.70 °C 0.42 °C 0.37 °C
f) Type S 0 °C ~ 100 °C 100 °C ~ 400 °C 400 °C ~ 1000 °C 1000 °C ~ 1760 °C		0.83 °C 0.48 °C 0.48 °C 0.42 °C
g) Type E -199 °C ~ 600 °C 600 °C ~ 1000 °C		0.09 °C 0.11 °C
h) RTD Measuring Devices (Indicator) -200 °C ~ 0 °C 0 °C ~ 300 °C 300 °C ~ 600 °C 600 °C ~ 800 °C		0.03 °C 0.06 °C 0.09 °C 0.10 °C

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C10 a) Surface Measuring Devices (With and Without Indicator) (Lab / Site) • Surface Probes • Surface Thermometers • Contact Probes • Contact Thermometers • Magnetic Thermometers • Magnetic Temperature Sensors 35 °C ~ 100 °C 100 °C ~ 200 °C 200 °C ~ 300 °C 300 °C ~ 400 °C	CTTM – T07 – 2007, Rev. 04	1.1 °C 1.2 °C 1.6 °C 1.6 °C
b) Surface Hot Plates (Lab / Site) 35 °C ~ 100 °C 100 °C ~ 200 °C 200 °C ~ 300 °C 300 °C ~ 400 °C	CTTM – T07 – 2007, Rev. 04	1.7 °C 1.7 °C 2.1 °C 2.1 °C
C11 Controlled Temperature Enclosures (Lab/Site) • Ovens • Freezers • Fridges • Incubators • Water Bath • Furnace • Chambers • Sterilizers -80 °C ~ 0 °C 0 °C ~ 50 °C 50 °C ~ 200 °C 200 °C ~ 400 °C 400 °C ~ 600 °C 600 °C ~ 800 °C 800 °C ~ 1000 °C 1000 °C ~ 1200 °C	CTTM – T08 – 2007, Rev. 07	1.6 °C 1.6 °C 1.9 °C 2.0 °C 4.2 °C 4.2 °C 4.4 °C 4.4 °C

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Controlled Temperature Enclosures (Site) -196 °C ~ -80 °C	CTTM – T08 – 2007, Rev. 07	2.8 °C
Autoclave and Pressurised Enclosure (Lab/Site) 121 °C	CTTM – T08 – 2007, Rev. 07	0.33 °C
Controlled Temperature/Humidity Enclosures (Lab/Site) -80 °C ~ 0 °C 0 °C ~ 50 °C 50 °C ~ 200 °C 200 °C ~ 400 °C 400 °C ~ 600 °C 600 °C ~ 800 °C 800 °C ~ 1000 °C 1000 °C ~ 1200 °C	CTTM – T09 – 2007, Rev. 06	1.6 °C 1.6 °C 1.9 °C 2.0 °C 4.2 °C 4.2 °C 4.4 °C 4.4 °C
Relative humidity at fixed Temperature (5 ~ 50) °C (10 ~ 20) % r.h. (20 ~ 40) % r.h. (40 ~ 60) % r.h. (60 ~ 95) % r.h.		* % r.h. = % relative humidity 6.4% r.h. & 0.60°C 6.4% r.h. & 0.60°C 6.4% r.h. & 0.60°C 6.4% r.h. & 0.60°C

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C12 Humidity / Temperature Measuring Devices (Lab) • Hygrometer • Humidity Meter • Hygrograph • Thermo Hygrograph • Data Logger • Hygrometer Indicator • Digital Humidity Meter • Humidity Sensor • Dew Meter Relative humidity at fixed Temperature (23 ~ 50) °C (20 ~ 40) % r.h (40 ~ 60) % r.h (60 ~ 90) % r.h Dry mode Temperature Calibration -75 °C ~ 0 °C 0 °C ~ 35 °C 35 °C ~ 50 °C 50 °C ~ 100 °C 100 °C ~ 150 °C	CTTM – T10 – 2007, Rev. 05	* % r.h. = % relative humidity 2.3% r.h. & 0.59°C 2.3% r.h. & 0.59°C 2.6% r.h. & 0.59°C 0.59 °C 0.59 °C 0.51 °C 0.80 °C 1.4 °C
C13 Humidity / Temperature Measuring Devices (Lab) • Hygrometers • Humidity Meters • Data Loggers • Hygrometer Indicators • Digital Humidity Meters • Humidity Sensors • Dew Meters	CTTM –T17 – 2007, Rev. 07	

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10 % r.h. ~ 35 % r.h. @ (5 ~15) °C 35 % r.h. ~ 65 % r.h. @ (5 ~15) °C 65 % r.h. ~ 95 % r.h. @ (5 ~15) °C		1.7 % r.h. & 0.29 °C 1.7 % r.h. & 0.29 °C 1.7 % r.h. & 0.29 °C
10 % r.h. ~ 35 % r.h. @ (15~35) °C 35 % r.h. ~ 65 % r.h. @ (15~35) °C 65 % r.h. ~ 95 % r.h. @ (15~35) °C		1.6 % r.h. & 0.29 °C 1.6 % r.h. & 0.29 °C 1.8 % r.h. & 0.29 °C
10 % r.h. ~ 35 % r.h. @ (35~50) °C 35 % r.h. ~ 65 % r.h. @ (35~50) °C 65 % r.h. ~ 95 % r.h. @ (35~50) °C		1.6 % r.h. & 0.29 °C 1.6 % r.h. & 0.29 °C 1.8 % r.h. & 0.29 °C
5 °C ~ 10 °C @ (10 ~95)% r.h. 10 °C ~ 20 °C @ (10 ~95)% r.h. 20 °C ~ 40 °C @ (10 ~95)% r.h. 40 °C ~ 60 °C @ (10 ~95)% r.h.		0.29 °C & 1.7 %r.h. 0.29 °C & 1.8 % r.h. 0.29 °C & 1.8 % r.h. 0.30 °C & 1.8 % r.h
Humidity / Temperature Measuring Devices (Site)		
10 % r.h. ~ 35 % r.h. @ (5 ~15) °C 35 % r.h. ~ 65 % r.h. @ (5 ~15) °C 65 % r.h. ~ 95 % r.h. @ (5 ~15) °C		1.7 % r.h. & 0.29 °C 1.7 % r.h. & 0.29 °C 1.7 % r.h. & 0.29 °C
10 % r.h. ~ 35 % r.h. @ (15~35) °C 35 % r.h. ~ 65 % r.h. @ (15~35) °C 65 % r.h. ~ 95 % r.h. @ (15~35) °C		1.6 % r.h. & 0.29 °C 1.6 % r.h. & 0.29 °C 1.8 % r.h. & 0.29 °C
10 % r.h. ~ 35 % r.h. @ (35~50) °C 35 % r.h. ~ 65 % r.h. @ (35~50) °C 65 % r.h. ~ 95 % r.h. @ (35~50) °C		1.6 % r.h. & 0.29 °C 1.6 % r.h. & 0.29 °C 1.8 % r.h. & 0.29 °C
5 °C ~ 10 °C @ (10 ~95)% r.h. 10 °C ~ 20 °C @ (10 ~95)% r.h. 20 °C ~ 40 °C @ (10 ~95)% r.h. 40 °C ~ 60 °C @ (10 ~95)% r.h.		0.29 °C & 1.7 %r.h. 0.29 °C & 1.8 % r.h. 0.29 °C & 1.8 % r.h. 0.30 °C & 1.8 % r.h

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C14 Dew Point Measuring Devices (Lab/Site) - Dew Meter - Chilled Mirror - Dew Point Sensor - Dew Point Meters -60 °C Frost point ~ -40 °C Dew point / Frost point -40 °C Frost point ~ 0 °C Dew point / Frost point 0 °C Dew point / Frost point ~ 20 °C Dew point	CTTM – T18 – 2007, Rev. 06	1.9 °C (Dew point/Frost point) 1.7 °C (Dew point/Frost point) 0.28 °C Dew point
C15 Temperature Measuring Devices With / Without indicators (Site) -100 °C ~ -80 °C -80 °C ~ -40 °C -40 °C ~ 100 °C 100 °C ~ 300 °C 300 °C ~ 400 °C 400 °C ~ 500 °C 500 °C ~ 1000 °C 1000 °C ~ 1200 °C	CTTM - T02 - 2007, Rev. 08 CTTM - T03 - 2007, Rev. 06	0.31 °C 0.16 °C 0.07 °C 0.06 °C 0.43 °C 0.55 °C 3.4 °C 3.9 °C
C16 Temperature Measuring Devices (Thermistor) (Lab) Triple Point of Water (0.01 °C) (0 ~ 30) °C Gallium Melting Point (29.7646 °C)	CTTM - T02 - 2007, Rev. 08	4 mK 0.025 °C 7 mK

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D. Dimensional		
D1 Geometrical Measurement		
Flatness measurement (Lab)	CTTM – D01 – 2024, Rev. 00	
Optical Parallel Día 12 mm		0.3 µm
Dial Test Indicator Up to 100 mm		3.0 µm
101 mm to 500 mm		3.0 µm
Up to 1000 mm		3.0 µm
Parallelism & Straightness Measurement (Lab)	CTTM – D01 – 2024, Rev. 00	
Optical parallel		0.65 µm
Dial Test Indicator Up to 100 mm		3.0 µm
101 mm to 1000 mm		3.0 µm
Mu-Checker System Up to 100 mm		0.4 µm
101 mm to 1000 mm		0.4 µm
Angle measurement (Lab & Site)	CTTM – D01 – 2024, Rev. 00	
Optical Comparator Protractor Up to 360 °		6 minutes (Lab & Site)
D2 Limit Gauges (Lab)	CTTM – D01 – 2024, Rev. 00	
Plain Plug Gauges or Pin Gauges Up to 25 mm		0.7 µm
Plain Ring Gauges Up to 50 mm		2.4 µm
50 mm to 225 mm		5.0 µm

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Micrometer Head 0 to 25 mm 0 to 50 mm Holtest Micrometer Up to 5" Digimatic Analog D4 Caliper (Lab) Slider Caliper 0 to 150 mm 0 to 200 mm 0 to 300 mm 0 to 600 mm 0 to 1000 mm Depth Caliper 0 to 150 mm 0 to 200 mm 0 to 300 mm 0 to 600 mm Caliper Gauges Internal, External and Thickness Type (Dial and Digimatic) 0 to 60 mm 60 mm to 70 mm 70 mm to 135 mm 100 mm to 160 mm	CTTM – D02 – 2024, Rev. 00 CTTM – D02 – 2024, Rev. 00 CTTM – D03 – 2024, Rev. 00 CTTM – D03 – 2024, Rev. 00 CTTM – D03 – 2024, Rev. 00	1.0 µm 1.0 µm 0.000095 inches 0.00012 inches 10.0 µm 10.0 µm 10.0 µm 10.0 µm 10.0 µm 10.0 µm 10.0 µm 10.0 µm 24 µm 10.0 µm 10.0 µm 10.0 µm 10.0 µm

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D5 Height Gauge Instrument (Lab & Site) Height Gauge (Resolution 0.001 mm) 0 to 300 mm 0 to 600 mm	CTTM – D04 – 2024, Rev. 00	1.0 µm 1.0 µm / 2.0 µm
D6 Dial and Level Type Instrument (Lab) Dial Gauges/ Indicator Dial Test Indicator Lever Probe Indicator Micro Indicator (Resolution 0.001 mm) (Graduation 0.001 & 0.01 mm) 0 to 5 mm 0 to 10 mm 0 to 30 mm 0 to 50 mm 0 to 100 mm	CTTM – D05 – 2024, Rev. 00	0.5 µm 0.7 µm 1.0 µm 1.3 µm 2.4 µm
D7 Linear and Indicating Instrument (Lab) Linear Gauges Linear Transducer Digimatic Indicator Indicating Gauge 0 to 12 mm (Resolution 0.001 mm) 0 to 30 mm (Resolution 0.0005 mm) 0 to 50 mm (Resolution 0.001 mm)	CTTM – D06 – 2024, Rev. 00	0.6 µm 0.3 µm 0.6 µm

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D8 End Standard (Lab)		
End Standard length measurement (Extension Rods, Standard Rods) Using DTI System	CTTM – D07 – 2024, Rev. 00	
Up to 25 mm		2.0 µm
>25 mm to 50 mm		2.0 µm
>50 mm to 75 mm		2.0 µm
>75 mm to 100 mm		2.0 µm
>100 mm to 200 mm		2.0 µm
>200 mm to 400 mm		2.0 µm
>400 mm to 600 mm		3.0 µm
>600 mm to 800 mm		3.0 µm
>800 mm to 1000 mm		3.0 µm
Using Mu-checker System	CTTM – D07 – 2024, Rev. 00	
Up to 25 mm		2.0 µm
>25 mm to 50 mm		2.0 µm
>50 mm to 75 mm		2.0 µm
>75 mm to 100 mm		2.0 µm
>100 mm to 200 mm		2.0 µm
>200 mm to 400 mm		2.0 µm
>400 mm to 600 mm		3.0 µm
>600 mm to 800 mm		4.0 µm
>800 mm to 1000 mm		5.0 µm
Feeler Gauge Up to 1 mm	CTTM – D07 – 2024, Rev. 00	0.6 µm

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D10 Parallel Screw Gauges (Lab) Thread Plug External and Internal Thread Up to 80 mm Pitch Diameter Major Diameter Pitch Distance Angle Thread Ring Up to 80 mm Pitch Diameter Minor Diameter	CTTM – D15– 2024, Rev. 00 CTTM – D15– 2024, Rev. 00	 2 µm 2 µm 5 µm 6 minutes 4 µm 5 µm
D11 Cylinder Gauges including Bore Gauges (Lab) Length Accuracy Up to 450 mm Up to 600mm	CTTM – D16– 2024, Rev. 00	 1 µm 1 µm
D12 Measurement Die Crimping Tool (Lab) Hand Crimp Tools	CTTM – D20– 2024, Rev. 00	12 µm
D13 Profile Projector (Lab & Site) Up to 200 mm	CTTM – D14– 2024, Rev. 00	0.005 mm (Lab) 0.007 mm (Site)
D14 Toolmaker microscope (Lab & Site) Up to 200 mm	CTTM – D26– 2024, Rev. 00	0.005 mm (Lab) 0.007 mm (Site)

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D15 Gauge Block (Same Material) (Lab) 0.5 mm to 25mm 25 mm to 50 mm 50 mm to 100mm	CTTM – D23– 2024, Rev. 00	0.17 µm 0.19 µm 0.26 µm
D16 Universal Length Measuring Machine (Lab & Site) Up to 100 mm	CTTM – D13– 2024, Rev. 00	0.0002 mm
D17 Thickness and Depth Gauges (Lab & Site) Up to 12 mm Depth Gauges Up to 25 mm / Res 0.01 mm	CTTM – D09– 2024, Rev. 00	0.0006 mm (Lab) 0.0010 mm (Site) 0.01 mm
D18 Coating thickness measurement (Lab) Coating Gauges Up to 8 mm Foil thickness Up to 25 mm	CTTM – D11– 2024, Rev. 00	0.003 mm 0.0006 mm
D19 Ultrasonic Thickness Gauge (Lab) Up to 150 mm 150 to 200 mm	CTTM – D27– 2024, Rev. 00	0.01 mm 0.1 mm

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D20 Spirit Level (Lab) Sensitivity Measurement Flatness	CTTM – D19– 2024, Rev. 00	2.0 seconds 0.003 mm
D21 Dial Gauge Calibrator (Lab) Up to 25 mm (Grad 0.001 mm) Up to 50 mm (Grad 0.002 mm)	CTTM – D22– 2024, Rev. 00	0.0002 mm 0.0005 mm
D22 Pitch Gauge Up to 200 mm	CTTM – D15– 2024, Rev. 00	5 µm
D23 Roughness Measurement	CTTM – D21– 2024, Rev. 00	0.40 µm RA

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

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Approved Signatories:

Mr V. Siva	- For categories A, B, C, E, and F
Mr Kyaw Moe Shein	- For categories A, C and F
Mr Jaswanth Lal D	- For items A15-A19, A24, A27 & A30, categories B, C and E
Mr Ayyappan Mahalingam	- For items A1-A21 and A24-A33, items B1-B21, items C1, C2, C3 (with indicator only), C6-C14
Mr Ananthakumar Sivasamy	- For items A1-A21, A25-A29, A33-37 and items C1-C6, C8, C10-C12, C14, C15
Mr Prem Kumar Seeri Ram	- For items A1-A21, A25-A29, A30-A37
Mr Narasimman Rao Appana	- For items A1-A14, A15-A18, A28, A30, category B and E
Mr Mohan Vasanth	- For items A1-A3, A5, A9, A15-A19, category B, items C1-C6, C9-C13, C15-C16 and category E
Mr Roopesh Sivaraman	- For items B1, B3-B6, B8, B11 (all items limited to calibration up to 5 and ½ digit multimeter only)
Mr Kaartigeish Sivaraman	- For items A1-A3, A5, A9, A15-A19 and category C
Mr T. Naventhan	- For items A1-A3, A5, A9, A15-A19
Ms Bhuvaneswari Mohanraj	- For items C1-C10, C12, C13, C16
Mr Sandip Singh	- For items C9, C10, C12, C13, C15
Mr Arunkumarren Bhaskaran	- For items A1 to A3, A5, A9, A15-A19
Mr M. Karunanithi	- For items A1-A3, A5, A9, A15-A19, A25-A27, A33-A37 and category D
Mr Surendren R Palpanadan	- For items A25-A27, A33-A37 and category D
Mr Noor Mohamed Azrin	- For items D1-D12, D17-D19 and D23

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Note:

This laboratory is accredited in accordance with the recognized 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 test 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.