Issue date: 24 July 2025
Valid Until: -

NO: SAMM 308
(Issue 2, 24 July 2025 replacement
of SAMM 308 dated 24 July 2025)

LABORATORY LOCATION/ CENTRAL OFFICE:	Multitech Calibration Services Sdn. Bhd. No. 48 B, Jalan BRP 6/11 Section U20, Bukit Rahman Putra 47000 Sungai Buloh, Selangor , 47000, SELANGOR MALAYSIA
ACCREDITED SINCE :	24 JULY 2025
FIELD(S) OF CALIBRATION:	HEAT & TEMPERATURE FORCE MASS PRESSURE ELECTRICAL VOLUME (VOLUMETRIC) TORQUE

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment 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 and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

*** The uncertainty covered by the CMC is expressed as the expanded uncertainty corresponding to a coverage probability of approximately 95 % and have a coverage factor of k=2 unless stated otherwise.**

CENTRAL LOCATION	Multitech Calibration Services Sdn. Bhd. No. 48 B, Jalan BRP 6/11 Section U20, Bukit Rahman Putra 47000 Sungai Buloh, Selangor , 47000, Selangor
FIELD(S) OF CALIBRATION :	HEAT & TEMPERATURE, FORCE, MASS, PRESSURE, ELECTRICAL, VOLUME, TORQUE

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Temperature Sensor	-80 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.07 °C 0.15 °C 0.27 °C	Comparison with Standard Resistance Thermometer in calibration bath and heat block, humidity chamber
	400 °C to 700 °C 700 °C to 1100 °C	1.9 °C 2.5 °C	Comparison with Standard Thermocouple in calibration heat block
Temperature Sensor With Indicator	-80 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.07 °C 0.17 °C 0.29 °C	Comparison with Standard Resistance Thermometer in calibration bath and heat block, humidity chamber
	400 °C to 700 °C 700 °C to 1100 °C	2.0 °C 2.7 °C	Comparison with Standard Thermocouple in calibration heat block
Temperature Indicating Instrument By Electrical Simulation Type K	-200 °C to 1372 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type J	-200 °C to 1200 °C	0.50 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type T	-250 °C to 400 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type S	-20 °C to 1767 °C	2.0 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type R	-20 °C to 1767 °C	2.0 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type N	-200 °C to 1300 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90

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Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Temperature Indicating Instrument By Electrical Simulation Type E	-250 °C to 1000 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Rtd	-200 °C to 850 °C	0.20 °C	By electrical simulation calibrator and reference table to ITS-90
Liquid In Glass Thermometer Total Immersion	-80 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.07 °C 0.12 °C 0.27 °C	Comparison with PT100 Reference in Liquid Bath and Temperature Block Calibrator
Liquid In Glass Thermometer Partial Immersion	-80 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.07 °C 0.12 °C 0.28 °C	Comparison with PT100 Reference in Liquid Bath and Temperature Block Calibrator
Liquid In Glass Thermometer Temperature Block Calibrator	-80 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C 400 °C° to 700 °C 700 °C° to 1100 °C	0.06 °C 0.11 °C 0.14 °C 1.2 °C 1.8 °C	Calibration using PRT Sensor and Thermocouple Type S
Liquid In Glass Thermometer Temperature Liquid Bath Calibrator	-80 °C to 50 °C 50 °C to 250 °C	0.06°C 0.11 °C	Calibration using PRT Sensor
Air Temperature	-30 °C to 80 °C	0.5 °C	Refer to NML Temperature & Humidity Measurement by CSIRO Division of Applied Physics
Relative Humidity	20% RH to 98% RH	2% RH	Refer to NML Temperature & Humidity Measurement by CSIRO Division of Applied Physics

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SCOPE OF CALIBRATION : FORCE

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Load Proving Devices, Load Cell Other Force Measuring Devices	0 N to 9.8 N 9.8 N to 98 N 98 N to 980 N	0.004 N 0.04 N 0.33 N	Refer to ISO 376 calibration using standard load cell and standard weight
Compression And Tension Modes	0 kN to 10 kN 10 kN to 50 kN 50 kN to 450 kN	0.007 kN 0.008 kN 0.43 kN	Refer to ISO 376 calibration using standard load cell and standard weight

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SCOPE OF CALIBRATION : MASS

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±)*	Remarks
Standard Weight And Artefacts	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 25 kg	0.010 mg 0.010 mg 0.010 mg 0.011 mg 0.012 mg 0.013 mg 0.014 mg 0.015 mg 0.017 mg 0.019 mg 0.023 mg 0.026 mg 0.029 mg 0.034 mg 0.035 mg 0.054 mg 0.14 mg 1.3 mg 2.5 mg 13 mg 15 mg 98 mg 0.13 g 0.14 g	Mass comparison with reference to OIML R111-1, Edition 2004(E) Calibrations may be given in other units by conversion from SI units

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SCOPE OF CALIBRATION : PRESSURE

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Vacuum Gauge	-13 psi to 0 psi	0.005 psi	Refer to BS EN 837-1:1998
Pneumatic	0 psi to 30 psi 30 psi to 300 psi 300 psi to 1000 psi 1000 psi to 2000 psi	0.01 psi 0.05 psi 0.3 psi 3.3 psi	Refer to BS EN 837-1:1998
Hydraulic	0 psi to 1000 psi 1000 psi to 10000 psi 10000 psi to 14500 psi	0.3 psi 3.3 psi 3.9 psi	Refer to BS EN 837-1:1998
Manometer	0 mbar to 70 mbar	0.008 mbar	Refer to BS EN 837-1:1998

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SCOPE OF CALIBRATION : ELECTRICAL

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Time & Frequency Tachometer Angular Velocity Non-contact	0 rpm to 36000 rpm	1.7 rpm	Calibration using RPM Calibrator
Time & Frequency Tachometer Contact	0 rpm to 6000 rpm	1.9 rpm	Calibration using RPM Calibrator
Time & Frequency Tachometer Linear Velocity Contact	0 m/min to 1100 m/min	0.57 m/min	Calibrator using RPM Calibrator with known Diameter Wheel
Time & Frequency Stopwatch	Up to 10800 s	0.031 s	Refer to NIST Publication 960- 12
Time & Frequency Timer	Up to 10800 s	0.24 s	Refer to NIST Publication 960- 12

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SCOPE OF CALIBRATION : VOLUME (VOLUMETRIC)

Instrument Calibrated/Measurement Parameter	**Range**	**Calibration and Measurement Capability Expressed as an Uncertainty (±)***	**Remarks**
Piston Pipette (pova)	10 µl to 100 µl 20 µl to 200 µl 30 µl to 300 µl 100 µl to 1000 µl 500 µl to 5000 µl 1 ml to 10 ml	0.1 µl 0.2 µl 0.4 µl 0.8 µl 3.9 µl 7.8 µl	Calibrated by gravimetric method. Refer to ISO 8655-6.
Burette	5 ml 10 ml 25 ml 50 ml 100 ml	0.011 ml 0.017 ml 0.023 ml 0.043 ml 0.055 ml	Calibrated by gravimetric method. Refer to ISO 385
Graduated Pipette	1 ml 2 ml 5 ml 10 ml	0.006 ml 0.011 ml 0.022 ml 0.043 ml	Calibrated by gravimetric method. Refer to ISO 835
One Mark Volumetric	5 ml to 100 ml 200 ml to 500 ml 1000 ml to 5000 ml	0.06 ml 0.24 ml 0.60 ml	Calibrated by gravimetric method. Refer to ISO 1042.
Measuring Cylinder	5 ml 10 ml 25 ml 50 ml 100 ml 250 ml 500 ml 1000 ml 2000 ml	0.05 ml 0.08 ml 0.15 ml 0.36 ml 0.36 ml 0.60 ml 1.4ml 2.5 ml 3.6 ml	Calibrated by gravimetric method. Refer to ISO 4788.

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SCOPE OF CALIBRATION : TORQUE

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±)*	Remarks
Torque Measuring Devices	2 Nm to 10 Nm Above 10 Nm to 30 Nm	0.82 % of reading 0.69 % of reading	Calibration using digital torque meters with reference to BS 7882:2017.
	Above 30 Nm to 75 Nm Above 75 Nm to 100 Nm Above 100 Nm to 150 Nm Above 150 Nm to 200 Nm	1.2 % of reading 0.80 % of reading 0.61 % of reading 0.41 % of reading	Calibration using digital torque meters with reference to BS 7882:2017.
Torque Tools Devices	0.2 Nm to < 10 Nm 10 Nm to < 30 Nm 30 Nm to < 200 Nm 200 Nm to 1000 Nm	1.6 % of reading 1.0 % of reading 1.54 % of reading 1.72 % of reading	Calibration using digital torque meters with reference to ISO 6789-2:2017

SITE LOCATION (HQ)	1. Site Name 1
FIELD(S) OF CALIBRATION :	ELECTRICAL,FORCE,HEAT & TEMPERATURE,MASS,PRESSURE

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Sensor	-30 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.10 °C 0.18 °C 0.30 °C	Comparison with Standard Resistance Thermometer in calibration bath and heat block.
	400 °C to 700 °C 700 °C to 1100 °C	2.0 °C 2.6 °C	Comparison with Standard Thermocouple in calibration heat block.

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Sensor With Indicator	30 °C to 50 °C 50 °C to 250 °C 250 °C to 400 °C	0.07 °C 0.19 °C 0.30 °C	Comparison with Standard Resistance Thermometer in calibration bath and heat block
	400 °C to 700 °C 700 °C to 1100 °C	2.1 °C 2.7 °C	Comparison with Standard Thermocouple in calibration heat block
Temperature Indicating Instrument By Electrical Simulation Type K	-200 °C to 1372 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type J	-200 °C to 1200 °C	0.50 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type T	-250 °C to 400 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type S	-20 °C to 1767 °C	2.0 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type R	-20 °C to 1767 °C	2.0 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type N	-200 °C to 1300 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Type E	-250 °C to 1000 °C	0.40 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Indicating Instrument By Electrical Simulation Rtd	-200 °C to 850 °C	0.20 °C	By electrical simulation calibrator and reference table to ITS-90
Temperature Controlled Enclosure	-80 °C to 250 °C 250 °C to 700 °C 700 °C to 1100 °C	0.50 °C 1.9 °C 3.0 °C	Calibrated by using temperature recorder with thermocouple and PRT
Humidity Chamber	20 % RH to 98 % RH	2 % RH	Calibrated by using thermohygrometer

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SCOPE OF CALIBRATION : FORCE

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Universal Testing Machine	0 N to 9.8 N 9.8 N to 98 N 98 N to 500 N	0.004 N 0.04 N 0.33 N	Refer to ISO 7500-1 calibration using standard load cell and standard weight
Compression And Tension Modes	0 kN to 10 kN 10 kN to 50 kN	0.007 kN 0.009 kN	Refer to ISO 7500-1 calibration using standard load cell and standard weight
Compression Mode Only	50 kN to 450 kN	0.45 kN	Refer to ISO 7500-1 calibration using standard load cell and standard weight

SCOPE OF CALIBRATION : MASS

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Balances And Weighing Instruments	Up to 50 g Up to 200 g Up to 500 g Up to 1 kg Up to 5 kg Up to 10 kg Up to 20 kg Up to 50 kg Up to 200 kg Up to 500 kg Up to 1,000 kg	0.2 mg 0.9 mg 2.1 mg 7 mg 0.06 g 0.13 g 0.47 g 1.7 g 4 8 g 100 g 200 g	Calibration with reference to ASTM E898-20 and Euramet cg 18 v4.0.

SCOPE OF CALIBRATION : PRESSURE

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Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Vacuum Gauge	-13.0 psi to 0 psi	0.005 psi	Refer to BS EN 837-1:1998
Pneumatic	0 psi to 30 psi 30 psi to 300 psi 300 psi to 1000 psi 1000 psi to 2000 psi	0.01 psi 0.05 psi 0.3 psi 3.3 psi	Refer to BS EN 837-1:1998
Hydraulic	0 psi to 1000 psi 1000 psi to 10000 psi 10000 psi to 14500 psi	0.3 psi 3.3 psi 3.9 psi	Refer to BS EN 837-1:1998
Manometer	0 mbar to 70 mbar	0.008 mbar	Refer to BS EN 837-1:1998

SCOPE OF CALIBRATION : ELECTRICAL

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Time & Frequency Rpm Measurement Non-contact	0 rpm to 40000 rpm	2.0 rpm	Calibration using Tachometer
Time & Frequency Timer	Up to 10800 s	0.24 s	Refer to NIST Publication 960- 12