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LABORATORY LOCATION/ CENTRAL OFFICE: 	VNA Engineering Sdn Bhd D11-8-G, Block 11 Pusat Perdagangan Dana 1 Jalan PJU 1A/46 47301 Petaling Jaya, Selangor , 47301, SELANGOR MALAYSIA
ACCREDITED SINCE :	14 APRIL 2025
FIELD(S) OF CALIBRATION:	MASS PRESSURE VOLUME HEAT & TEMPERATURE ELECTRICAL

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	VNA Engineering Sdn Bhd D11-8-G, Block 11 Pusat Perdagangan Dana 1 Jalan PJU 1A/46 47301 Petaling Jaya, Selangor , 47301, Selangor
FIELD(S) OF CALIBRATION :	MASS, PRESSURE, VOLUME, HEAT & TEMPERATURE, ELECTRICAL

SCOPE OF CALIBRATION : MASS

Schedule

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Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Standard Weight/ Dead Weight/test Weight	1 mg	0.02 mg	Calibrated using reference standard weight by comparison method with reference to OIML R111-1 2004 (E)
	2 mg	0.02 mg	
	5 mg	0.02 mg	
	10 mg	0.02 mg	
	20 mg	0.02 mg	
	50 mg	0.02 mg	
	100 mg	0.02 mg	
	200 mg	0.02 mg	
	500 mg	0.02 mg	
	1 g	0.02 mg	
	2 g	0.02 mg	
	5 g	0.02 mg	
	10 g	0.03 mg	
	20 g	0.03 mg	
	50 g	0.05 mg	
	100 g	0.2 mg	
	200 g	0.2 mg	
	500 g	2 mg	
	1 kg	2 mg	
	2 kg	0.02 g	
	5 kg	0.02 g	
	10 kg	0.2 g	
	20 kg	0.2 g	

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SCOPE OF CALIBRATION : PRESSURE

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Pressure Measuring Device Pneumatic	-0.9 bar to 0 bar Above 0 bar to 0.07 bar Above 0.07 bar to 0.7 bar 0 bar to 7 bar abs Above 0.7 bar to 7 bar Above 7 bar to 20 bar Above 20 bar to 30 bar	0.008 bar 0.000007 bar 0.00012 bar 0.0028 bar abs 0.003 bar 0.008 bar 0.011 bar	Calibrated using reference pressure calibrator by comparison method with reference to MSA Test Method 1 and 2 - 2022
Hydraulic	0 bar to 700 bar Above 700 bar to 1000 bar	0.14 bar 0.016 % of reading	Calibrated using deadweight tester or by comparison method with reference to MSA Test Method 1 and 2 - 2022

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SCOPE OF CALIBRATION : VOLUME

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Pipette	0 ml to 1 ml 1 ml to 2 ml 2 ml to 5 ml 5 ml to 10 ml 10 ml to 25 ml	0.004 ml 0.007 ml 0.02 ml 0.03 ml 0.06 ml	Calibrated using analytical balance and distilled water based on ISO 835.
Piston Operated Volumetric Apparatus (pova)	10 μ l to 200 μ l 200 μ l to 500 μ l 500 μ l to 1000 μ l 1 ml to 5 ml 5 ml to 10 ml	0.2 μ l 0.6 μ l 1.2 μ l 5.8 μ l 12 μ l	Calibrated using analytical balance and distilled water based on ISO 8655-6 and ISO 8655-2.
Burette	0 ml to 5 ml 5 ml to 10 ml 10 ml to 25 ml 25 ml to 50 ml 50 ml to 100 ml	0.004 ml 0.006 ml 0.015 ml 0.03 ml 0.06 ml	Calibrated using analytical balance and distilled water based on ISO 385.
Measuring Cylinder	0 ml to 5 ml 5 ml to 10 ml 10 ml to 25 ml 25 ml to 100 ml 100 ml to 250 ml 250 ml to 500 ml 500 ml to 1000 ml 1000 ml to 2000 ml	0.03 ml 0.06 ml 0.2 ml 0.3 ml 0.6 ml 1.4 ml 2.9 ml 5.8 ml	Calibrated using analytical balance and distilled water based on ISO 4788.
One Mark Volumetric Flask	0 ml to 10 ml 10 ml to 25 ml 25 ml to 100 ml 100 ml to 250 ml 250 ml to 500 ml 500 ml to 1000 ml 1000 ml to 2000 ml	0.02 ml 0.03 ml 0.06 ml 0.09 ml 0.2 ml 0.3 ml 0.4 ml	Calibrated using analytical balance and distilled water based on ISO 1042

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SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Sensor (thermocouple, Prt, Mechanical Thermometer, Thermistor)	-80°C to 30°C 31 °C to 200°C 201 °C to 650 °C 651 °C to 1200 °C	0.03°C 0.03 °C 0.4 °C 2.7 °C	Comparison with standard resistance thermometer in: alcohol bath, oil bath, block bath
Temperature Block Calibrator /liquid Bath	-80 °C to 250°C 251 °C to 650°C 651 °C to 1200 °C	0.03°C 0.03 °C 2.3 °C	Comparison with standard resistance thermometer/ thermocouple according to EURAMET/cg-11
Temperature Measuring Devices (air Temperature)	-20 °C to 65 °C	0.1°C	Comparison with PRT in chamber
Relative Humidity Measuring Device At 23 °C	2 % RH to 90 % RH 90% RH to 98 % RH	1.4 % RH 1.6 % RH	Comparison with standard thermohygrometer in temperature & humidity chamber
Liquid In Glass Thermometer (total & Partial Immersion)	-80°C to 30°C 31 °C to 200 °C 201 °C to 400 °C	0.04°C 0.04 °C 0.19 °C	Comparison with standard resistance thermometer in: alcohol bath, oil bath, block bath
Temperature Indicating Device K	-200 °C to 1370 ° C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device E	-200 °C to 1000 °C	0.2°C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device J	-200 °C to 1200 °C	0.2°C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device T	-200 °C to 400 °C	0.2°C	Calibrated by electrical simulation using calibrator and reference table to ITS-90

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Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Indicating Device N	-200 °C to 1300 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device B	600 °C to 1800 °C	2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device R	0 °C to 1700 °C	1 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device Pt100	-200 °C to 650 °C	0.1 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Calibrator K	-200 °C to -100 °C -100 °C to 1370 °C	0.4 °C 0.2 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator E	-200 °C to 1000 °C	0.2 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator J	-200 °C to -100 °C -100 °C to 1200 °C	0.3 °C 0.2 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator T	-200 °C to -100 °C -100 °C to 400 °C	0.4 °C 0.2 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90

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Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Temperature Calibrator N	-270 °C to -100 °C -100 °C to 1300 °C	0.6 °C 0.3 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator B	100 °C to 500 °C 500 °C to 1820 °C	5.5 °C 1.1 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator R	0 °C to 500 °C 500 °C to 1760 °C	1.1 °C 0.5 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator S	0 °C to 500 °C 500 °C to 1760 °C	1.1 °C 0.7 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Temperature Calibrator Pt100	-200 °C to 850 °C	0.02 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90
Infrared Radiation Thermometer	30 °C to 500 °C	3.4 °C	Calibrated by electrical measurement using multimeter and reference table to ITS-90

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SCOPE OF CALIBRATION : ELECTRICAL

Instrument Calibrated/Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty ($\pm$)*	Remarks
Time & Frequency Tachometer / Tachometer Calibrator I) Non-contact	0 rpm to 6000 rpm 6000 rpm to 30000 rpm	0.2 rpm 1.3 rpm	Calibrated using tachometer calibrator and tachometer based on ASTM F2046
Time & Frequency Tachometer / Tachometer Calibrator Ii) Contact	0 rpm to 3000 rpm	1.4 rpm	Calibrated using tachometer calibrator and tachometer based on ASTM F2046
Time & Frequency Stopwatch	0 sec to 60 sec 1 min to 5 min 5 min to 1 hour 1 hour to 3 hour	0.2 sec 0.2 sec 0.2 sec 0.2 sec	Calibrated by using comparison method according to NIST stop watch and timer calibration
Time & Frequency Timer	0 sec to 60 sec 1 min to 5 min 5 min to 1 hour 1 hour to 3 hour	0.2 sec 0.2 sec 0.2 sec 0.2 sec	Calibrated by using comparison method according to NIST stop watch and timer calibration

SITE LOCATION (HQ)	1. CATEGORY I
FIELD(S) OF CALIBRATION :	ELECTRICAL,HEAT & TEMPERATURE,MASS,PRESSURE

SCOPE OF CALIBRATION : MASS

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Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Standard Weight/ Dead Weight/test Weight	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	- - - - - - - - - - - - - - - - - - 0.1 g 0.1 g 0.2 g 0.4 g 0.7 g	Calibrated using reference standard weight by comparison method with reference to OIML R111-1 2004 (E)
Analytical Balance And Weighing Scale	0 g to 20 g 0 g to 50 g 0 g to 100 g 0 g to 200 g 0 g to 1 kg 0 kg to 2 kg 0 kg to 5 kg 0 kg to 10 kg 0 kg to 20 kg 0 kg to 50 kg 0 kg to 100 kg 0 kg to 200 kg 0 kg to 300 kg 0 kg to 600 kg	2 mg 2 mg 2 mg 2 mg 0.02 g 0.02 g 0.02 g 0.2 g 0.2 g 0.02 kg 0.02 kg 0.2 kg 0.2 kg 0.2 kg	1. Calibrated using standard weight based on ASTM E898-20 2. The calibration covers the instrumental error, repeatability, hysteresis and eccentricity test

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
Pressure Measuring Device Pneumatic	-0.9 bar to 0 bar Above 0 bar to 0.07 bar Above 0.07 bar to 0.7 bar 0 bar to 7 bar abs Above 0.7 bar to 7 bar Above 7 bar to 20 bar Above 20 bar to 30 bar	0.008 bar 0.000057 bar 0.00058 bar 0.0063 bar abs 0.0064 bar 0.018 bar 0.058 bar	Calibrated using reference pressure calibrator by comparison method with reference to MSA Test Method 1 and 2 - 2022
Pressure Measuring Device Hydraulic	0 bar to 700 bar	0.59 bar	Calibrated using reference pressure calibrator by comparison method with reference to MSA Test Method 1 and 2 - 2022

SCOPE OF CALIBRATION : HEAT & TEMPERATURE

Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Sensor With Indicator	-45 °C to 30 °C 30 °C to 650 °C 651 °C to 1200°C	0.05 °C 0.3 °C 2.9 °C	Comparison with standard resistance thermometer / thermocouple in temperature block bath
Temperature Controlled Enclosures	-80 °C to 250 °C 251 °C to 660 °C 661 °C to 1200°C	0.6 °C 1.1 °C 2.8 °C	Using thermocouple and temperature recorder
Humidity Controlled Enclosure	30 %rh to 95 %rh	4 %rh	Using temperature and humidity data logger
Temperature & Relative Humidity Measuring Device At 23 °C	5 °C to 50 °C 10 %rh to 95 %rh	0.3 °C 2 %rh	Comparison with standard thermohygrometer in temperature & humidity chamber

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Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Temperature Indicating Device K	-200 °C to 1370 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device E	-200 °C to 1000 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device J	-200 °C to 1200 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device T	-200 °C to 400 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device N	-200 °C to 1300 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device B	100 °C to 1800 °C	2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device R	0 °C to 1700 °C	1 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90
Temperature Indicating Device Pt100	-200 °C to 650 °C	0.2 °C	Calibrated by electrical simulation using calibrator and reference table to ITS-90

SCOPE OF CALIBRATION : ELECTRICAL

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Material / Product Tested	Type Of Test / Properties Measured / Range Of Measurement	Standard Test Methods / Equipment / Techniques	Remarks
Time & Frequency Rpm Measuring Instrument	0 rpm to 30000 rpm	1.4 rpm	Calibrated using tachometer calibrator and tachometer based on ASTM F2046
Time & Frequency Stopwatch	0 sec to 60 sec 1 min to 5 min 5 min to 1 hour 1 hour to 3 hour	0.2 sec 0.2 sec 0.2 sec 0.2 sec	Calibrated by using comparison method according to NIST stop watch and timer calibration
Time & Frequency Timer	0 sec to 60 sec 1 min to 5 min 5 min to 1 hour 1 hour to 3 hour	0.2 sec 0.2 sec 0.2 sec 0.2 sec	Calibrated by using comparison method according to NIST stop watch and timer calibration

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