



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

SAFETECH CALIBRATION & INSPECTION OF PRECISION EQUIPMENT CO WLL.
#2,3,4-Ground Floor, Ahmadi Corner Mall (Bldg 77)
Ahmadi Industrial Area, Block 6, East Ahmadi
KUWAIT
Suraj James Phone: 00965 97288165

CALIBRATION

Valid to: March 31, 2023

Certificate Number: 5265.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,6}:

I. Chemical

Parameter/Equipment	Range	CMC ^{2,3} (±)	Comments
Conductivity Meters	100 µS/cm 1413 µS/cm	3.3 µS/cm 16 µS/cm	Standard buffer solution
pH Meters	4 pH 7 pH 10 pH	0.02 pH 0.02 pH 0.02 pH	Standard buffer solution
Gas Monitors and Detectors	NH ₃ Ammonia CL ₂ Chlorine H ₂ S Hydrogen Sulfide CO Carbon Monoxide LEL Methane O ₂ Oxygen	5 % 5 % 5 % 5 % 5 % 5 %	Standard reference gases

II. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Calipers	Up to 150 mm 0.01 mm Resolution 0.02 mm Resolution	5.8 µm 12 µm	Gage block set (Grade 0)
Micrometers	Up to 25 mm Up to 100 mm	0.61 µm 5.8 µm	Gage block set (Grade 0)
Coating Thickness Gauge	Up to 1500 µm	2.3 µm	Standard foil set and micrometer

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage – Generate	(0 to 330) mV (0 to 3.3) V (0 to 33) V (3 to 330) V (100 to 1000) V	20 µV/V + 1 µV 10 µV/V + 7 µV 10 µV/V + 60 µV 20 µV/V + 0.4 mV 20 µV/V + 1.6 mV	Fluke-5522A
DC Voltage – Measure	(0 to 200) mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1000) V	6 µV/V + 0.1 µV 2 µV/V + 2 µV 3 µV/V + 10 µV 4 µV/V + 100 µV 5 µV/V + 200 µV	8.5-digit Multimeter (Fluke-8508A)
DC High Voltage – Measure	(2 to 40) kV	0.87 kV	HV probe Fluke 80k-40

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Current – Generate	(0 to 330) μ A (0 to 3.3) mA (0 to 33) mA (0 to 330) mA (0 to 1.1) A (1.1 to 3) A (0 to 11) A	100 μ A/A + 20 nA 90 μ A/A + 90 nA 100 μ A/A + 300 nA 100 μ A/A + 3 μ A 200 μ A/A + 90 μ A 400 μ A/A + 40 μ A 500 μ A/A + 500 μ A	Fluke-5522A
Clamp-On Meters	Up to 10 A Up to 500 A Up to 1000 A	250 μ A/A + 85 mA 3.5 mA/A + 0.5 A 3.6 mA/A + 0.8 A	Fluke-5522 with 50 turn coil
DC Current – Measure	(0 to 200) μ A 200 μ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A (2 to 20) A	10 μ A/A + 0.7 nA 10 μ A/A + 7 nA 10 μ A/A + 70 nA 30 μ A/A + 1 μ A 200 μ A/A + 20 μ A 400 μ A/A + 0.4 mA	8.5-digit Multimeter
Capacitance – Generate	(0.220 to 0.6) nF (0.6 to 1) nF (1 to 11) nF (11 to 110) nF 110 nF to 1.1 μ F (1.1 to 11) μ F (11 to 110) μ F 110 μ F to 1.1 mF (1.1 to 11) mF (11 to 100) mF	2.1 mF/F + 10 pF 4.5 mF/F + 10 pF 2.3 mF/F + 10 pF 3.5 mF/F + 0.2 pF 3.5 mF/F 3.5 mF/F 5.8 mF/F + 30nF 5.4 mF/F + 20 nF 5.5 mF/F + 20 nF 13 mF/F + 80 μ F	Fluke-5522A
Resistance – Generate	(0 to 11) Ω (11 to 110) Ω 110 Ω to 1.1 k Ω (1.1 to 11) k Ω (11 to 110) k Ω 110 k Ω to 1.1 M Ω (1.1 to 11) M Ω (11 to 110) M Ω (110 to 1100) M Ω	90 $\mu\Omega/\Omega$ + 0.5 m Ω 30 $\mu\Omega/\Omega$ + 1.1 m Ω 30 $\mu\Omega/\Omega$ + 1.4 m Ω 30 $\mu\Omega/\Omega$ + 2.0 m Ω 30 $\mu\Omega/\Omega$ + 2.2 m Ω 40 $\mu\Omega/\Omega$ + 580 m Ω 100 $\mu\Omega/\Omega$ + 120 Ω 600 $\mu\Omega/\Omega$ + 5 k Ω 17 m Ω/Ω + 2 M Ω	Fluke-5522A

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Resistance – Measure	(0 to 2) Ω (2 to 20) Ω (20 to 200) Ω (200 to 2) kΩ (2 to 20) kΩ (20 to 200) kΩ 200 kΩ to 2 MΩ (2 to 20) MΩ (20 to 200) MΩ 200 MΩ to 2 GΩ	3 μΩ/Ω + 60 μΩ 6 μΩ/Ω + 60 μΩ 7 μΩ/Ω + 0.1 mΩ 0.6 μΩ/Ω + 14 mΩ 8 μΩ/Ω + 15 mΩ 8 μΩ/Ω + 0.11 Ω 10 μΩ/Ω + 1.2 Ω 20 μΩ/Ω + 100 Ω 80 μΩ/Ω + 10 kΩ 500 μΩ/Ω + 1 MΩ	8.5-digit Multimeter (Fluke-8508A)
Insulation Resistance – Generate (Up to 1 kV)	Up to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ (1 to 10) GΩ (10 to 20) GΩ (20 to 40) GΩ (40 to 60) GΩ (60 to 80) GΩ (80 to 100) GΩ	0.8 kΩ 0.011 MΩ 0.79 MΩ 0.95 MΩ 0.039 GΩ 0.16 GΩ 0.62 GΩ 1.6 GΩ 2.6 GΩ 3.9 GΩ	Insulation tester calibrator time electronics 5069
Insulation Resistance – Generate (Up to 10 kV)	100 MΩ to 1 GΩ (1 to 10) GΩ (10 to 20) GΩ (20 to 40) GΩ (40 to 60) GΩ (60 to 80) GΩ (80 to 100) GΩ	0.95 MΩ 0.039 GΩ 0.16 GΩ 0.62 GΩ 1.6 GΩ 2.6 GΩ 3.9 GΩ	Insulation tester calibrator time electronics 6059

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Simulation of Temperature Instruments – Generate			
Pt 100	(-200 to 0) °C (0 to 800) °C	0.0001 °C/°C + 0.07 0.0002 °C/°C + 0.07	Fluke-5522A
B Type TC	(600 to 1800) °C	0.45 °C	
C Type TC	(0 to 2300) °C	0.85 °C	
E Type TC	(-250 to 1000) °C	0.51 °C	
J Type TC	(-200 to 1200) °C	0.29 °C	
K Type TC	(-200 to 1350) °C	0.42 °C	
L Type TC	(-200 to 900) °C	0.39 °C	
N Type TC	(-200 to 1300) °C	0.42 °C	
R Type TC	(0 to 1700) °C	0.58 °C	
S Type TC	(0 to 1700) °C	0.48 °C	
T Type TC	(-250 to 400) °C	0.64 °C	
U Type TC	(-200 to 600) °C	0.57 °C	
Electrical Simulation of Temperature Instruments – Measure			
Pt 100	(-200 to 0) °C (0 to 800) °C	0.1 °C 0.24 °C	Fluke-5522A & 8.5-digital Multimeter (Fluke-8508A)
B Type TC	(600 to 1800) °C	0.47 °C	Fluke-5522A
C Type TC	(0 to 2300) °C	0.86 °C	
E Type TC	(-250 to 1000) °C	0.53 °C	
J Type TC	(-200 to 1200) °C	0.32 °C	
K Type TC	(-200 to 1350) °C	0.43 °C	
L Type TC	(-200 to 900) °C	0.41 °C	
N Type TC	(-200 to 1300) °C	0.43 °C	
R Type TC	(0 to 1700) °C	0.59 °C	
S Type TC	(0 to 1700) °C	0.50 °C	
T Type TC	(0 to 400) °C	0.65 °C	
U Type TC	(-200 to 600) °C	0.59 °C	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate			
(1 to 330) mV	10 Hz 20 kHz 50 kHz 100 kHz	0.2 mV/V + 30 μV 0.8 mV/V + 6 μV 0.9 mV/V + 30 μV 2.5 mV/V + 10 μV	Fluke-5522A
(0.33 to 3.3) V	10 Hz 20 kHz 50 kHz 100 kHz 450 kHz	380 μV/V + 10 μV 380 μV/V + 10 μV 800 μV/V + 40 μV 2.9 mV/V + 400 μV 2.9 mV/V + 700 μV	
(3.3 to 33) V	10 Hz 20 kHz 50 kHz 90 kHz	380 μV/V + 100 μV 400 μV/V + 300 μV 900 μV/V + 1 mV 900 μV/V + 2 mV	
(33 to 330) V	45 Hz 10 kHz 50 kHz 100 kHz	150 μV/V + 9.5 mV 180 μV/V + 19 mV 2.2 mV/V + 40 mV 2.2 mV/V + 60 mV	
1000 V	45 Hz 1 kHz 5 kHz 8 kHz	300 μV/V + 12 mV 260 μV/V + 7 mV 300 μV/V + 12 mV 300 μV/V + 12 mV	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure			
(100 to 200) mV	55 Hz 1 kHz 10 kHz 100 kHz	0.15 mV/V 0.10 mV/V + 2 μV 0.20 mV/V + 9 μV 0.80 mV/V + 11 μV	8.5-digit Multimeter (Fluke-8508A)
200 mV to 2 V	55 Hz 1 kHz 10 kHz 100 kHz	100 μV/V + 5 μV 80 μV/V + 9 μV 200 μV/V + 50 μV 700 μV/V + 20 μV	
(2 to 20) V	55 Hz 1 kHz 10 kHz 100 kHz	100 μV/V + 20 μV 80 μV/V + 20 μV 200 μV/V + 20 μV 600 μV/V + 200 μV	
(20 to 200) V	55 Hz 1 kHz 10 kHz 100 kHz	80 μV/V + 2.8 mV 70 μV/V + 2.1 mV 120 μV/V + 7.1 mV 500 μV/V + 20 mV	
(200 to 1000) V	55 Hz 1 kHz	100 μV/V + 31 mV 100 μV/V + 15 mV	
AC High Voltage – Measure			
(2 to 40) kV	60 Hz	1.6 kV	HV Probe (Fluke 80k-40)
AC Current – Generate			
(33 to 330) μA	45 Hz 1 kHz 10 kHz 30 kHz	1.5 mA/A + 100nA 1.8 mA/A + 80nA 8 mA/A + 400 nA 10 mA/A + 600 nA	Fluke-5522A
(0.3 to 3.3) mA	10 Hz 1 kHz 10 kHz 30 kHz	2 mA/A + 100 nA 1 mA/A + 200 nA 8 mA/A + 1 μA 9.4 mA/A + 3 μA	
(3.3 to 33) mA	10 Hz 5 kHz 10 kHz	1.8 mA/A + 0.7 μA 1.8 mA/A + 10 μA 3.4 mA/A + 20 μA	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current – Generate (cont)			
(33 to 330) mA	45 Hz 5 kHz 10 kHz	200 µA/A + 70 µA 2.1 mA/A + 100 µA 4.2 mA/A + 300 µA	Fluke-5522A
(0.33 to 1.1) A	45 Hz 5 kHz 10 kHz	0.6 mA/A + 30 µA 7.1 mA/A + 530 µA 7.1 mA/A + 530 µA	
(1.1 to 3.0) A	45 Hz 1 kHz 10 kHz	1.3 mA/A + 100 µA 6.8 mA/A + 400 µA 6.8 mA/A + 600 µA	
(3 to 11) A	(10 to 45) Hz 45 Hz to 1 kHz	1.0 mA/A + 2 mA 1.0 mA/A + 2 mA	
(11 to 20.9) A	(45 to 100) Hz 100 Hz to 5 kHz	2.1 mA/A + 5 mA 30 mA/A + 5 mA	
Clamp-On-Meters			
Up to 500 A Up to 1000 A	50 Hz 50 Hz	3.8 mA/A + 0.8 A 4.3 mA/A + 1.0 A	Fluke-5522 with 50 turn coil
AC Current – Measure			
(10 to 200) µA	55 Hz 1 kHz 10 kHz	500 µA/A + 20 nA 500 µA/A + 20 nA 300 µA/A + 60 nA	8.5-digit multimeter (Fluke-8508A)
200 µA to 2 mA	55 Hz 1 kHz 10 kHz	400 µA/A + 40 nA 300 µA/A + 30 nA 800 µA/A + 40 nA	
(2 to 20) mA	55 Hz 1 kHz 10 kHz	500 µA/A + 4 nA 500 µA/A + 4 nA 800 µA/A + 15 nA	
(20 to 200) mA	55 Hz 1 kHz 10 kHz	400 µA/A + 300 nA 400 µA/A + 300 nA 800 µA/A + 100 nA	
200 mA to 2 A	55 Hz 1 kHz 10 kHz	800 µA/A + 40 µA 800 µA/A + 40 µA 900 µA/A + 70 µA	
(2 to 20) A	55 Hz 1 kHz	10 mA/A + 100 µA 10 mA/A + 100 µA	

IV. Fluid Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Piston Operated Volumetric Apparatus	10 µl (>10 to 100) µl (>100 to 1000) µl (>1000 to 2000) µl (>2000 to 5000) µl	0.28 µl 0.31 µl 0.91 µl 1.8 µl 4.4 µl	Analytical balance
Laboratory Volumetric Apparatus	(2 to 10) ml (10 to 100) ml (100 to 200) ml	0.027 ml 0.39 ml 0.42 ml	Analytical balance

V. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Scales and Balances	Up to 20mg (50 to 200) mg 500 mg 1 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g (1 to 5) kg 10 kg 20 kg 100 kg	0.01 mg 0.02 mg 0.03 mg 0.05 mg 0.06 mg 0.07 mg 0.09 mg 0.12 mg 0.20 mg 0.36 mg 58 mg 58 mg 61 mg 68 mg 5.8 g	OIML E2 class weight set
Torque Tools	Up to 25 Nm Up to 100 Nm Up to 500 Nm Up to 1000 Nm Up to 3000 Nm	0.28 Nm 0.64 Nm 2.3 Nm 9.2 Nm 11 Nm	Norbar torque tester with transducer

Parameter/Equipment	Range	CMC ^{2,3,5} (±)	Comments
Pressure – Measure and Measuring Equipment	(-1 to 0) Bar	0.59 mBar	Fluke dead weight testers P3023
	(0.03 to 2) Bar	0.61 mBar	P3023
	(2 to 10) Bar	1 mBar	P3031
	(10 to 20) Bar	2 mBar	
	(20 to 30) Bar	3 mBar	
	(30 to 40) Bar	4 mBar	
	(40 to 50) Bar	5 mBar	
	(50 to 60) Bar	6 mBar	
	(60 to 70) Bar	7 mBar	
	(20 to 500) Bar	0.05 Bar	P3116
(20 to 1000) Bar	0.21 Bar		
(20 to 1400) Bar	0.37 Bar		

VI. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,3,5} (±)	Comments
Temperature – Measuring Equipment	(-40 to 150) °C	0.06 °C	Temperature read out (Fluke-1529) & RTD probe (Fluke-5628)
	(150 to 660) °C	0.09 °C	
Temperature – Measure	(-197 to 150) °C	0.02 °C	Temperature read out (Fluke-1529) & RTD probe (Fluke-5628)
	(150 to 660) °C	0.07 °C	
	(660 to 1000) °C	4.9 °C	K type thermocouple
Humidity – Measuring Equipment	(7 to 95) % RH	1.4 % RH	Humidity generator (5128A)
Infrared Thermometers	(35 to 100) °C	0.88 °C	IR calibrator (Fluke-4181)
	(100 to 350) °C	1.9 °C	
	(350 to 500) °C	2.4 °C	

VII. Time and Frequency

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Frequency – Measure	10 Hz to 350 MHz	1.2 parts in 10 ⁷	Frequency counter (Keysight-53220A)
Timer & Stopwatch	(10 to 36 000) s	0.06 s	Frequency counter (Keysight-53220A)

¹ This laboratory offers commercial calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer’s device and to influences from the circumstances of the specific calibration.

³ In the statement of CMC, percentage refers to percent of reading.

⁴ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMC are expressed as either a specific value that covers the full range or as a fraction/percentage of the reading plus a fixed floor specification.

⁵ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

⁶ This scope meets A2LA’s *P112 Flexible Scope Policy*.