



CERTIFICATE OF ACCREDITATION

This is to attest that

METROMAC CALIBRATION SERVICES WLL

P.O BOX: 200239, BUILDING No. 5, SHOP NO. 6 & 8
BARWA VILLAGE, AL WAKRAH, QATAR

Calibration Laboratory CL-208

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with the ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website (www.iasonline.org).

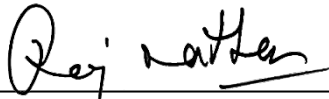
This certificate is valid up to October 1, 2020.

(See laboratory's scope of accreditation for fields of calibration and accredited calibration.)



This accreditation certificate supersedes any IAS accreditation bearing an earlier effective date. The certificate becomes invalid upon suspension, cancellation or revocation of accreditation. See www.iasonline.org for current accreditation information, or contact IAS at 562-364-8201.




Raj Nathan
President



SCOPE OF ACCREDITATION

IAS Accreditation Number	CL-208
Accredited Entity	METROMAC CALIBRATION SERVICES WLL
Address	P.O Box: 200239, Building No. 5, Shop NO. 6 & 8, Barwa Village, Al Wakrah, Qatar
Contact Name	Mr. Aji Jacob
Telephone	+974-44515336
Effective Date of Scope	November 19, 2019
Accreditation Standard	ISO/IEC 17025:2017

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Dimensional			
Dial Gauge	0 mm to 25 mm	2.9 µm	DIAL CALIBRATION TESTER, Kudale Instruments, 812/19 ,Calibration Procedure MQS03 C133
Outside Micrometer	0 mm to 25 mm 25 mm to 50 mm 50 mm to 75 mm 75 mm to 100 mm	2.3 µm 2.7 µm 2.9 µm 3.5 µm	0 Grade Gauge Block Set, KOBA, 89216, Procedure MQS03 C134
Caliper Digital	0 mm to 300 mm	15 µm	0 Grade Gauge Block Set, KOBA, 89216, Procedure MQS03 C78
Caliper Analog	0 mm to 600 mm	30 µm	0 Grade Gauge Block Set, KOBA, 89216, Procedure MQS03 C78
Feeler Gauge	0 mm to 1 mm	1.2 µm	Digital Micrometer, Standard 5S01206 Procedure MQS03 C135
Mechanical			
Hydraulic pressure (gauge mode)	100 bar to 1000 bar	0.31 bar	Digital pressure gauge Additel 681. Metromac Calibration Procedure MQS03 C98
	6 bar to 60 bar 60 bar to 1400 bar	0.008 bar 0.018 bar	Hydraulic dead weight tester 287N. Metromac Calibration Procedure MQS03 C98
Pneumatic pressure (gauge mode)	0.001 bar to 3.5 bar	0.02 % + 0.6 mbar	PRESSURE CALIBRATOR GE DRUCK CM1 Metromac Calibration Procedure MQS03 C99
	0.01 bar to 100 bar	0.02 % + 6.6 mbar	
Thermal			
Digital thermometer	-20 °C to 150 °C	0.054 °C	Digital thermometer ThermoProbe, Metromac Calibration Procedure MQS03 C101



SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Oven	25 °C to 100 °C 100 °C to 150 °C 150 °C to 250 °C	1.2 °C 1.3 °C 1.4 °C	Data logger HIOKI LR8401-20, Metromac Calibration Procedure MQS03 C104 (9 points)
Incubator	20 °C to 100 °C	1.0 °C	Multifunction Calibrator DRUCK DPI 880, Metromac Calibration Procedure MQS03 C106 (5 points)
Refrigerators / Freezers	-30 °C to 20 °C	1.1 °C	Data logger HIOKI LR8401-20, Metromac Calibration Procedure MQS03 C105 (9 points)
Liquid baths	-30 °C to 250 °C	1.2 °C	Multifunction Calibrator DRUCK DPI 880, Metromac Calibration Procedure MQS03 C108 (5 points)
Glass Thermometer	-5 °C to 130 °C 130 °C to 400 °C	0.4 °C 1.2 °C	Digital thermometer ThermoProbe, Metromac Calibration Procedure MQS03 C130
Thermohygrometer	10 °C to 70 °C 10 %RH to 95 %RH	0.5 °C 1.2 %RH	Constant Climate Chamber, Binder, 2019000002373 Calibration Procedure MQS03 C131
Muffle furnace	100 °C to 850 °C 850 °C to 1100 °C	2.7 °C 4 °C	MULTIFUNCTION CALIBRATOR, Druck, 8800017476, TC-N type,RS,PMH-064 Calibration Procedure MQS03 C132
Electrical/DC/Low Frequency			
AC Voltage Generate ⁴	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 500 kHz) 33 mV to 329.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz)	0.55 x 10 ⁻³ + 6.5 μV 0.28 x 10 ⁻³ + 4.8 μV 0.29 x 10 ⁻³ + 4.3 μV 0.65 x 10 ⁻³ + 4.3 μV 1.9 x 10 ⁻³ + 7.4 μV 4.4 x 10 ⁻³ + 28 μV 0.27 x 10 ⁻³ + 12 μV 90 x 10 ⁻⁶ + 7.1 μV 99 x 10 ⁻⁶ + 7.1 μV	Multifunction Calibrator, 5520A,1539001 MetroMac Calibration Procedure / MQS03 C103



SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
AC Voltage Generate ⁴ continued	33 mV to 329.999 mV (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz) 0.33 V to 3.29999 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 500 kHz) 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 100 kHz) 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 100 kHz) 330 V to 1000 V (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.21 x 10 ⁻³ + 6.8 μV 0.48 x 10 ⁻³ + 19 μV 1.2 x 10 ⁻³ + 43 μV 0.16 x 10 ⁻³ + 73 μV 73 x 10 ⁻⁶ + 35 μV 0.11 x 10 ⁻³ + 42 μV 0.17 x 10 ⁻³ + 45 μV 0.40 x 10 ⁻³ + 84 μV 1.3 x 10 ⁻³ + 0.34 μV 0.16 x 10 ⁻³ + 0.78 mV 87 x 10 ⁻⁶ + 0.32mV 0.14x10 ⁻³ +0.46 mV 0.22x10 ⁻³ +0.61 mV 0.57x 10 ⁻³ + 1.3 mV 0.11 x 10 ⁻³ +3.5 mV 0.11 x10 ⁻³ + 4.6 mV 0.14 x 10 ⁻³ +4.5 mV 0.44 x 10 ⁻³ +11 mV 1.1 x 10 ⁻³ +28 mV 0.16 x 10 ⁻³ + 49 mV 0.14 x 10 ⁻³ + 46 mV 0.17 x 10 ⁻³ + 44 mV	Multifunction Calibrator, 5520A,1539001 MetroMac Calibration Procedure / MQS03 C103
DC Voltage Generate ⁴	3 mV to 329.9999 mV 0.33 V to 3.299999 V 3.3 V to 32.99999 V 33 V to 329.9999 V 330 V to 1000 V	14 x 10 ⁻⁶ + 1.9 μV 7.2 x 10 ⁻⁶ + 2.7 μV 8.0 x 10 ⁻⁶ + 16 μV 12 x 10 ⁻⁶ + 0.16 mV 12 x 10 ⁻⁶ + 1.2 mV	Multifunction Calibrator, 5520A,1539001 MetroMac Calibration Procedure / MQS03 C 103
Resistance Generate ⁴	0 Ω to 10.9999 Ω 11 Ω to 32.9999 Ω 33 Ω to 109.9999 Ω 110 Ω to 329.9999 Ω 330 Ω to 1.099999 kΩ 1.1 kΩ to 3.299999 kΩ 3.3 kΩ to 10.99999 kΩ 11 kΩ to 32.99999 kΩ 33 kΩ to 109.9999 kΩ	33 x 10 ⁻⁶ + 5.6 mΩ 18 x 10 ⁻⁶ + 8.2 mΩ 17 x 10 ⁻⁶ + 8.2 mΩ 17 x 10 ⁻⁶ + 11 mΩ 16 x 10 ⁻⁶ + 11 mΩ 16 x 10 ⁻⁶ + 0.11 Ω 16 x 10 ⁻⁶ + 77 mΩ 16 x 10 ⁻⁶ + 0.55 Ω 16 x 10 ⁻⁶ + 0.58 Ω	Multifunction Calibrator, 5520A,1539001, MetroMac Calibration Procedure / MQS03 C103
Resistance Generate ⁴ continued	110 kΩ to 329.9999 kΩ 330 kΩ to 1.099999 MΩ 1.1 MΩ to 3.299999 MΩ	20 x 10 ⁻⁶ + 6.5 Ω 20 x 10 ⁻⁶ + 17 Ω 36 x 10 ⁻⁶ + 0.14 kΩ	Multifunction Calibrator, 5520A,1539001,



SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
	3.3 MΩ to 10.99999 MΩ 11 MΩ to 32.99999 MΩ 33 MΩ to 109.9999 MΩ 110 MΩ to 329.999 MΩ 330 MΩ to 1100 MΩ	74 x 10 ⁻⁶ + 0.25 kΩ 0.14 x 10 ⁻³ + 1.5 kΩ 0.29 x 10 ⁻³ + 2.9 kΩ 1.7 x 10 ⁻³ + 56 kΩ 8.2 x 10 ⁻³ + 0.31 MΩ	MetroMac Calibration Procedure / MQS03 C103
DC Current Generate ⁴	3 μA to 329.999 μA 330 μA to 3.29999 mA 3.3 mA to 32.9999 mA 33 mA to 329.999 mA 330 mA to 2.99999 A 3 A to 10.9999 A 11 A to 20.5 A	86 x 10 ⁻⁶ + 12 nA 57 x 10 ⁻⁶ + 18 nA 57 x 10 ⁻⁶ + 0.12 μA 57 x 10 ⁻⁶ + 1.2 μA 0.12 x 10 ⁻³ + 22 μA 0.28 x 10 ⁻³ + 0.22 mA 0.56 x 10 ⁻³ + 0.52 mA	Multifunction Calibrator, 5520A, 1539001, MetroMac Calibration Procedure / MQS03 C103
AC Current Generate ⁴	29.00 μA to 329.99 μA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz) 0.33 mA to 3.2999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz) 3.3 mA to 32.999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz) 33mA to 329.99mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz)	1.2 x 10 ⁻³ + 77 nA 0.88 x 10 ⁻³ + 77 nA 0.77 x 10 ⁻³ + 65 nA 1.8 x 10 ⁻³ + 89 nA 4.5 x 10 ⁻³ + 0.12 μA 11 x 10 ⁻³ + 0.23 μA 1.2 x 10 ⁻³ + 0.48 μA 0.69 x 10 ⁻³ + 0.50 μA 0.60 x 10 ⁻³ + 0.26 μA 1.1 x 10 ⁻³ + 0.24 μA 2.8 x 10 ⁻³ + 0.30 μA 7.8 x 10 ⁻³ + 0.85 μA 1.0 x 10 ⁻³ + 2.9 μA 0.52 x 10 ⁻³ + 2.7 μA 0.25 x 10 ⁻³ + 2.3 μA 0.52 x 10 ⁻³ + 1.7 μA 1.3 x 10 ⁻³ + 3.0 μA 3.0 x 10 ⁻³ + 6.3 μA 1.0 x 10 ⁻³ + 29 μA 0.52 x 10 ⁻³ + 27 μA 0.30 x 10 ⁻³ + 23 μA 0.61 x 10 ⁻³ + 34 μA 1.3 x 10 ⁻³ + 61 μA 3.5 x 10 ⁻³ + 0.12 mA	Multifunction Calibrator, 5520A, 1539001, MetroMac Calibration Procedure / MQS03 C103
AC Current Generate ⁴ continued	0.33 A to 2.19999 A (10 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz)	0.97 x 10 ⁻³ + 0.25 mA 0.38 x 10 ⁻³ + 0.20 mA 3.2 x 10 ⁻³ + 0.57 mA	



SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
	(5 kHz to 10 kHz 3 A to 10.9999 A (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 5 kHz) 11 A to 20.5 A (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 5 kHz)	14 x 10 ⁻³ + 2.7 mA 0.43 x 10 ⁻³ + 3.3 mA 0.59 x 10 ⁻³ + 3.0 mA 14 x 10 ⁻³ + 1.3 mA 0.72 x 10 ⁻³ + 6.9 mA 0.86 x 10 ⁻³ + 6.6 mA 14 x 10 ⁻³ + 3.3 mA	Multifunction Calibrator, 5520A,1539001, MetroMac Calibration Procedure / MQS03 C103
Capacitance Generate ⁴ @45Hz	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 1.1 µF to 3.29999 µF 3.3 µF to 10.9999 µF 11 µF to 32.9999 µF 33 µF to 109.999 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 mF to 32.9999 mF 33 mF to 110 mF	2.7 x 10 ⁻³ + 5.5 pF 2.8 x 10 ⁻³ + 5.5 pF 3.0 x 10 ⁻³ + 5.5 pF 1.2 x 10 ⁻³ + 9 pF 1.4 x 10 ⁻³ + 55 pF 1.2 x 10 ⁻³ + 90 pF 1.4 x 10 ⁻³ + 0.18 nF 1.2 x 10 ⁻³ + 0.9 nF 1.4 x 10 ⁻³ + 1.8 nF 1.3 x 10 ⁻³ + 9 nF 2.3 x 10 ⁻³ + 18 nF 2.5 x 10 ⁻³ + 85 nF 2.6 x 10 ⁻³ + 0.2 µF 2.5 x 10 ⁻³ + 0.86 µF 2.6 x 10 ⁻³ + 1.9 µF 2.5 x 10 ⁻³ + 8.3 µF 4.2 x 10 ⁻³ + 18 µF 6 x 10 ⁻³ + 76 µF	Multifunction Calibrator, 5520A,1539001, MetroMac Calibration Procedure / MQS03 C103
<i>Time/Frequency</i>			
Frequency Generate ⁴ Voltage specified @50 V	0.01 Hz to 119.99 Hz 120 Hz to 1199.9 Hz 1.2 kHz to 11.999 kHz 12 kHz to 119.99 kHz 120 kHz to 1199.9 kHz 1.2 MHz to 2 MHz	0.94 x 10 ⁻⁶ + 89 µHz 1.1 x 10 ⁻⁶ + 0.71 mHz 1.1 x 10 ⁻⁶ + 7.1 mHz 1.1 x 10 ⁻⁶ + 71 mHz 1.1 x 10 ⁻⁶ + 0.71 Hz 1.4 x 10 ⁻⁶ + 0.67 Hz	Multifunction Calibrator, 5520A,1539001, MetroMac Calibration Procedure / MQS03 C103



SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)^{1,2}

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
(Centrifuge/variable rotational Speed) Centrifuge, mixers, Orbit & PlateShaker, MST Apparatus, Autoclaves			Standard Tachometer, Extech, H.268533, Dig.Stop Watch, Extech, PMH-021 Procedure MQS03 C136
Speed	0 rpm to 5000 rpm	1.6 rpm	
Timer	0 min to 30 min	0.7 s	

¹The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a specific coverage probability of approximately 95 %. It is the smallest measurement uncertainty 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. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than that provided in the CMC due to the behavior of the customer’s device and to influences from the circumstances of the specific calibration.

²If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 “Guide for the Use of the International System of Units (SI)” apply.

³When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to percent of instrument reading or instrument output, as appropriate, unless otherwise indicated.

⁴Capability is suitable for the calibration of measuring devices in the stated ranges.