



SCOPE OF ACCREDITATION

IAS Accreditation Number	CL-178
Accredited Entity	Qatar Calibration Services W.L.L.
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Accreditation Standard	ISO/IEC 17025:2005

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

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
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<i>Dimensional</i>			
Digital Caliper	0 mm to 150 mm 0 mm to 300 mm	0.018 mm 0.02 mm	Grade 'O' Metric Gauge Block set
Micrometer	0 mm to 25 mm	0.003 mm	Gauge Block Set
Dial Guage / Indicator	0 mm to 25 mm	0.003 mm	Dial Calibration Tester
Orifice			
Bore Diameter	12 mm to 1000 mm	0.013 mm	Grade'0' Metric gauge block set, Digimatic indicator
Bevel Angle	Up to 180°	5'	Digital protractor
Edge Thickness	0 mm to 25 mm	0.014 mm	Digital depth Micrometer
Plate Thickness	0 mm to 25 mm	0.006 mm	Digital Micrometer
Plate Flatness	25 mm to 1000 mm	0.011 mm	Tool makers straight edges, Feeler Gauges
Concentricity	0 mm to 500 mm	0.26 mm	Vernier caliper
Orifice Edge Sharpness/Radius	0 mm to 1 mm	0.008 mm	Pin gauge, Foil impression tool, Microscope with still video camera
Plate Surface Roughness	0 mm to 1 mm	0.1 µm	Roughness standard with surface roughness tester



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<i>Mechanical</i>			
Air Pressure	15 mbar to 1000 mbar	0.2 mbar	Budenberg 551, Mass set
	0.5 bar to 30 bar	3 mbar	Budenberg 554, Mass set
	15 mbar to 1 bar	1 mbar	Beamex MC5 Calibrator
	1 bar to 20 bar 20 bar to 30 bar	8 mbar 15 mbar	Beamex MC5 Calibrator
Hydraulic Pressure	1 bar to 60 bar	7 mbar	Budenberg 580 VHX
	60 bar to 1400 bar	0.3 bar	Mass set
	1 bar to 60 bar	6 mbar	Beamex MC5 Calibrator
	60 bar to 600 bar	0.6 bar	Beamex External Pressure module
Differential Pressure	10 mbar to 1000 mbar at 0 bar to 200 bar static pressure	0.07 mbar	Budenberg 5501, Mass set
Manual Torque Wrench	30 N·m to 70 N·m	1 N·m	Norbar Pro-test 1500 Torque Tester
	70 N·m to 140 N·m	1.9 N·m	
	140 N·m to 300 N·m	3.7 N·m	
	300 N·m to 600 N·m	12.5 N·m	
	600 N·m to 900 N·m	20.4 N·m	
	900 N·m to 1200 N·m	24.2 N·m	
Pipette	0.1 mL to 1 mL	14 µL	Weighing balance with 0.1 mg readability
	1 mL to 10 mL	22 µL	
	10 mL to 20 mL	38 µL	
Anemometer , Fume hoods and AC ducts	0.5 m/s to 5 m/s	7 % of Reading	Alnor RVA+Rotating vane Anemometer, Extech 407123 Hot wire thermo anemometer
Weighing Balances and Scales	0 g to 10 g	0.6 mg	OIML Class E2 weights OIML Class E2 weights OIML Class F2 weights OIML Class M1 weights OIML Class M2 weights OIML Class M2 weights
	10 g to 100 g	0.62 mg	
	100 g to 1 kg	1.1 g	
	1 kg to 30 kg	6 g	
	30 kg to 100 kg	80 g	
	100 kg to 300 kg	0.15 kg	
<i>Thermal</i>			
Thermometer	-50 °C to 125 °C	0.038 °C	Isotech TTI - 7 Digital Temperature
	125 °C to 250 °C	0.35 °C	Indicator used with PRT Probes
	250 °C to 650 °C	1.1 °C	
	-50 °C to 125 °C	0.71 °C	
	125 °C to 250 °C	0.9 °C	Beamex MC5 Calibrator with T/C Parobe T/C-001
	250 °C to 650 °C	1.7 °C	



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Temperature Source	-50 °C to 125 °C	0.13 °C	Isotech TTI - 7 Digital Temperature
	125 °C to 250 °C	0.35 °C	Indicator used with PRT Probes
	250 °C to 650 °C	1.1 °C	
	-50 °C to 125 °C	0.71 °C	
RTD	125 °C to 250 °C	0.9 °C	MC5 Calibrator With T/C Probe T/C-001
	250 °C to 650 °C	1.7 °C	
	-50 °C to 125 °C	0.07 °C	Isotech TTI - 7 Digital Temperature Indicator used with PRT Probes
	125 °C to 250 °C	0.4 °C	
250 °C to 650 °C	1.2 °C		
Thermocouple	-50 °C to 125 °C	0.2 °C	Beamex MC5 Calibrator with T/C Probe T/C-001
	125 °C to 250 °C	0.5 °C	
	250 °C to 650 °C	1.6 °C	
	-50 °C to 125 °C	0.8 °C	Isotech TTI - 7 Digital Temperature Indicator used with PRT Probes
125 °C to 250 °C	0.8 °C		
250 °C to 650 °C	1.4 °C		
	-50 °C to 125 °C	1 °C	Beamex MC5 Calibrator with T/C Probe T/C-001
	125 °C to 250 °C	1.2 °C	
	250 °C to 650 °C	1.9 °C	
	Electrical/DC/Low Frequency		
DC Voltage Generate ⁴	0 mV to 330 mV	4 µV	Fluke 5520 A Calibrator
	0 V to 3.3 V	40 µV	
	0 V to 33 V	0.5 mV	
	30 V to 330 V	6 mV	
	100 V to 1000 V	35 mV	
AC Voltage Generate ⁴ @ 50 Hz	33 mV to 330 mV	25 µV	Fluke 5520 A Calibrator
	0.33 V to 3.3 V	0.2 mV	
	3.3 V to 33 V	2 mV	
	33 V to 330 V/1 mV	20 mV	
	330 V to 1020 V	0.3 V	
DC Current Generate ⁴	0 mA to 3.3 mA	0.5 µA	Fluke 5520 A Calibrator
	3.3 mA to 33 mA	1.5 µA	
	33 mA to 330 mA	9.8 µA	
	0.33 A to 1.1 A	0.2 mA	
	1.1 A to 11 A	1.5 mA	
	11 A to 20 A	18 mA	
AC Current Generate ⁴ @ 50 Hz	33 µA to 3.3 mA	4 µA	Fluke 5520 A Calibrator
	3.3 mA to 330 mA	12 µA	
	0.33 A to 1.1 A	2 mA	
	1.1 A to 11 A	15 mA	
	11 A to 20 A	23 mA	



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CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY ³ (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Resistance Generate ⁴	0 Ω to 11 Ω 11 Ω to 33 Ω 33 Ω to 110 Ω 110 Ω to 330 Ω 330 Ω to 1.1 kΩ 1.1 to 3.3 kΩ 3.3 kΩ to 11 kΩ 11 kΩ to 33 kΩ 33 kΩ to 110 kΩ 110 kΩ to 330 kΩ 330 kΩ to 1.1 MΩ 1.1 MΩ to 3.3 MΩ 3.3 MΩ to 11 MΩ	2.2 mΩ 2.5 mΩ 5.1 mΩ 20 mΩ 20 mΩ 0.1 Ω 0.5 Ω 0.95 Ω 4.1 Ω 12.8 Ω 85 Ω 570 Ω 1.92 kΩ	Fluke 5520 A Calibrator
DC Current Generate into Toroidal Type Clampmeter	10 A to 15 A 15 A to 150 A 150A to 1000 A	0.3 A 0.8 A 3.2 A	Fluke 5520 A Calibrator
DC Current Generate into Non-Toroidal Type Clampmeter	10 A to 15 A 15 A to 150 A 150A to 1000 A	0.3 A 1.2 A 6.3 A	Fluke 5520 A Calibrator
AC Current Generate into Toroidal Type Clampmeter @ 45 Hz to 65 Hz	10 A to 15 A 15A to 150 A 150 A to 1000 A	0.3 A 1.1 A 4.2 A	Fluke 5520 A Calibrator
AC Current Generate into Non Toroidal Type Clampmeter @ 45 Hz to 65 Hz	10 A to 15 A 15 A to 150 A 150 A to 1000 A	0.32 A 1.4 A 7.5 A	Fluke 5520 A Calibrator
DC Voltage Measure ⁵	0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	15 μV 0.2 mV 1.7 mV 45 mV	Agilent 3458 A Digital Multimeter
AC Voltage Measure ⁵ @ 50 Hz	1 mV to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 700 V	0.015 mV 0.15 mV 1.7 mV 32 mV 0.4 V	Agilent 3458 A Digital Multimeter
DC Current Measure ⁵	5 μA to 10 μA 10 μA to 100 μA 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A	1 nA 4.2 nA 40 nA 0.41 μA 6.2 μA 0.2 mA	Agilent 3458 A Digital Multimeter



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AC Current Measure ⁵ @ 50 Hz	100 µA 1 mA 10 mA 100 mA 1 A	0.14 µA 0.8 µA 0.025 mA 0.3 mA 2.8 mA	Agilent 3458 A Digital Multimeter
DC Resistance Measure ⁵	10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ	0.32 mΩ 2.4 mΩ 16 mΩ 21 mΩ 1.6 Ω 29 Ω 750 Ω 0.07 MΩ 7.3 MΩ	Agilent 3458 A Digital Multimeter
Frequency Measure ⁵	1 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 100 kHz 100 kHz to 3 MHz 3 MHz to 10 MHz	4.6 mHz 115 mHz 1.2 Hz 31 Hz 850 Hz 1.2 kHz	Agilent 3458 A Digital Multimeter
Frequency Generate ⁴	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 100 kHz 100 kHz to 1 MHz 1 MHz to 2 MHz	7 mHz 60 mHz 80 mHz 750 mHz 7 Hz 80 Hz 750 Hz	Fluke 5520 A Calibrator
Electrical Energy meter	0.01 kWh to 1 kWh	0.10 % of Reading	Zera MT 320 Portable Reference Standard
Chemical			
pH Meter	4.00 pH 7.00 pH 10.00 pH	0.03 pH 0.031 pH 0.041 pH	Standard buffer solutions
Conductivity meter	84 µS/cm 1413 µS/cm 12.88 mS/cm	0.8 µS/cm 15.0 µS/cm 0.14 mS/cm	Standard buffer solutions

¹The uncertainty covered by the Calibration and Measurement Uncertainty (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.



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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 instrument reading or instrument output, as appropriate, unless otherwise indicated.

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

⁵Capability is suitable for the calibration of devices intended to generate the measurand in the stated ranges.