United Arab Emirates

هـيـئـة الإمـــارات للمواصـــفات والمقاييـــس
Emirates Authority For Standardization & Metrology

Certificate of Accreditation

EMIRATES NATIONAL ACCREDITATION SYSTEM
Has Accredited
METROMAC AUTOMATION CALIBRATION LAB
As Calibration Laboratory
NAL 004

Located in Mussafah, Abu Dhabi, UAE

The Laboratory complies with the requirements of the Standard **ISO/IEC 17025:2005**
'General Requirements for the Competence of Testing and Calibration Laboratories' & the Relevant ILAC Guidelines
for the calibrations specified in the attached Accreditation Scope. The accreditation requires regular surveillance.
The organization itself is responsible for the results of performed calibrations
Date of Initial Accreditation was 08/06/2008

Date of Renewal: 08/06/2013 **Valid Until: 07/06/2016**

Dr. Rashid Ahmed Bin Fahad
Minister of Environment and Water
Chairman of ESMA

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Accreditation Scope

METRO MAC AUTOMATION Calibration Laboratory, NAL 004
Mussafah, Abu Dhabi, UAE

#	Measurand	Measuring Range	CMC (±)	Description of Method and Equipment Used
Electrical				
1	DC Voltage	10µV to 100 mV	0.002 %	Direct comparison of generated DC voltage from calibrator using METRO MAC standard Calibration procedure. Equipment Used : Multi-product Calibrator Fluke 5520A Serial No: 8675003
		100 mV to 1 V	0.002 %	
		1 V to 10 V	0.002 %	
		10 V to 100 V	0.002 %	
		100 V to 1000 V	0.002%	
2	AC Voltage	1 mV to 10 mV		Direct comparison of generated AC voltage from calibrator using METRO MAC standard Calibration procedure. Equipment Used : Multi-product Calibrator Fluke 5520A Serial No: 8675003
		50 Hz to 10 kHz	0.84 %	
		10kHz to 100 kHz	0.84 %	
		10 mV to 100 mV		
		50 Hz to 10 kHz	0.03 %	
		10 kHz to 100 kHz	0.1 %	
		100 mV to 1 V		
		50 Hz to 10 kHz	0.03 %	
		10 kHz to 100 kHz	0.08 %	
		1 V to 10 V		
		50 Hz to 10 kHz	0.03 %	
		10 kHz to 100 kHz	0.08 %	
		10 V to 100 V		
		50 Hz to 10 kHz	0.03%	
		10 kHz to 100 kHz	0.08%	
		100 V to 1020 V		
		50 Hz to 100 kHz	0.04%	
3	DC Current	20 µA to 1 mA	0.02%	Direct comparison of generated DC current From calibrator using METRO MAC standard Calibration procedure. Equipment Used : Multi-product Calibrator Fluke 5520A Serial No: 8675003
		1 mA to 100 mA	0.02%	
		100 mA to 1 A	0.03%	
		1 A to 10 A	0.06%	
		10 A to 20 A	0.1%	
		10 A to 1000 A	0.11%	Comparison to Calibrator 5520A passing current through 50 turn current coil

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#	Measurand	Measuring Range	CMC (±)	Description of Method and Equipment Used
4	Resistance	1 Ω to 100 Ω	0.1%	Direct comparison of stepped resistance from calibrator using METRO MAC standard Calibration procedure. Equipment used:. Multi-product Calibrator Fluke 5520A Serial No: 8675003
		0.1 kΩ to 10 kΩ	0.006%	
		10 kΩ to 100 kΩ	0.005%	
		0.1 MΩ to 1 MΩ	0.005%	
		1 MΩ to 10 MΩ	0.06%	
		10 MΩ to 300 MΩ	0.06%	
5	AC Current	50 µA to 100 µA 50 Hz to 1 kHz	0.2%	Direct comparison of generated AC current from calibrator using METRO MAC standard Calibration procedure. Equipment used : Multi-product Calibrator Fluke 5520A Serial No: 8675003
		0.1 mA to 1 mA 50 Hz to 10 kHz	0.2%	
		1 mA to 10 mA 50 Hz to 10 kHz	0.05%	
		10 mA to 2 A 50 Hz to 1 kHz	0.07%	
		2 A to 10 A 50 Hz to 1 kHz	0.1%	
		10 A to 20 A 50 Hz to 1 kHz	0.1%	
		10 A to 1000 A Frequency 45-65 Hz	0.13%	Comparison to Calibrator 5520A passing current through 50 turn current coil
Temperature				
6	Digital Thermometers (RTD /Thermocouple Sensors with Indicator) Readability 0.01°C	-40 °C to 100°C	0.5°C	Comparison Method by using: 1- Temperature Calibrator, Ametek Sl No : 541928-00743 2- Calibration Bath, Sl No:B33455 3- SPRT Probe Pt 100,Sl No : 860771 4- Digital Multimeter Fluke Sl No : 9422016
	Digital Thermometers (RTD /Thermocouple Sensors with Indicator) Readability 0.01°C	100 °C to 420°C	1.1°C	

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#	Measurand	Measuring Range	CMC (±)	Description of Method and Equipment Used
7	Oven Freezer/ Chiller Incubator Water Bath	-30°C to 250°C	1°C 0.8°C 0.8°C 0.8°C	Comparison Method By using 1- Digital Temperature Data logger Yokogawa 2- Flexible PRT Probes pt 100 3- Multifunction Calibrator Druck,TRX
Pressure				
8	Hydraulic Pressure Gauges Low Range	1 to 60 bar	0.03 bar	Direct comparison with pressure balanced by standard weights applying force on a piston cylinder assembly. Equipment used Dead Weight Tester DH BUDENBERG 580HXA Piston Cylinder S/N 374H
9	Hydraulic Pressure Gauges High Range	60 to 700 bar 700 to 1200 bar	0.18 bar 0.4 bar	Direct comparison with pressure balanced by standard weights applying force on a piston cylinder assembly. Equipment used Dead Weight Tester DH BUDENBERG 580HXA Piston Cylinder S/N 374H
10	Pneumatic Pressure Gauges	0.005 bar to 20 bar	0.02 bar	Direct comparison with pneumatic pressure calibrator Equipment used Pressure Calibrator DRUCK DPI601 S/N 9469/93-3 & PACE 1003
11	Vacuum Gauges	-0.005 to -0.8 bar	0.021 bar	Direct comparison using vacuum source and a standard pressure Indicator. Equipment used : Precision Pressure Indicator DRUCK DPI 705 S/N 70532796

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#	Measurand	Measuring Range	CMC (±)	Description of Method and Equipment Used
Dimensional Length				
12	Vernier Calipers Readability 0.01 mm	1mm to 150 mm 1mm to 200 mm 1mm to 300 mm 1mm to 600 mm	10 µm 10 µm 10 µm 15 µm	Comparison Method 1- Set of gauge Blocks Tesa, Sl no: '2018.320 2- 125 mm Block Tesa,Sl No :86717 3- 200 mm Block Tesa ,Sl No : 87350 4- 300 mm Block Tesa Sl No : 87143 5- Caliper Checker Aditya,Sl No:823 6- 25mm,50mm,75mm, 100mm Gauge Blocks Make:Tesa, Sl No;15.30066,1.30075, 16.30069,2.30065
13	Outside Micrometers Readability 0.001 mm	1 to 25 mm 25 to 50 mm 50 to 75 mm 75 to 100 mm	2 µm 2 µm 2 µm 2 µm	Comparison Method 1- Set of gauge Blocks Tesa Sl no: '2018.320 2- 125 mm Block Tesa Sl No :86717 3- 200 mm Block Tesa Sl No : 87350 4- 300 mm Block esa Sl No : 87143 5- Set of Slip Gauges Aditya,Sl No:2898 6- 25mm,50mm,75mm, 100mm Gauge Blocks Make:Tesa, Sl No;15.30066,1.30075, 16.30069,2.30065
14	Outside Micrometers Readability 0.01 mm	1 mm to 150 mm 150mm to 300 mm	10 µm 10 µm	
Volume				
15	Micropipettes	1µl - 10 µl	0.08µl	By using Automatic Pipette Station having Ambient Conditions Monitor Measuring Module (Microbalance)
	Micropipettes	10µl - 100 µl	0.09µl	
	Micropipettes	100µl - 1000 µl	0.39µl	
	Micropipettes	1000µl - 10000 µl	3.78µl	

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#	Measurand	Measuring Range	CMC (±)	Description of Method and Equipment Used
Mass				
16	Digital Weighing Balance	'0 - 21 g Readability 0.001 mg	0.09 mg	Comparison Method By using E2 Class Weights Set
	Digital Weighing Balance	0- 220 g Readability 0.01 mg	0.24 mg	
	Digital Weighing Balance	0- 1000 g Readability 0.001g	0.0016 g	
17	Digital Weighing Balance	0- 6200 g Readability 0.01g	0.03 g	Comparison Method By using E2 Class Weights Set & F1 Class Weight
	Digital Weighing Balance	0- 30 kg Readability 0.5g	0.64 g	
18	Digital Weighing Balance	0- 300 kg Readability 10 g	18.44 g	Comparison Method By using E2 Class Weights Set,F1 Class Weights & M1 Class Weights
	Digital Weighing Balance	0- 500 kg Readability 50 g	70.75 g	
END				

Program's Manager Signature

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