



# Accreditation Scope

**Metromac Automation Calibration Lab, NAL 004**  
**Calibration Laboratory, (ISO/IEC 17025:2017)**

**M32, Mussafah Industrial Area, Abu Dhabi, UAE**

Issue Date: 02-11-2022

Expiry Date: 01-09-2025

Issue No: 10

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)		
Electrical (Measure)	Capacitance	0.2 nF to 100 mF	0.5 %	Metromac WI-C51:2022	P		
	Frequency	100 Hz to 2 MHz	0.2 %				
	Temperature simulation	RTD – 4 wires (PT 100) (-200 to 800) °C	0.1 °C				
		Type K (-200 to 1370) °C	0.5 °C				
		Type J (-210 to 1200) °C	1 °C				
	DC Voltage	10 µV to 1 V	0.01 %				
		1 V to 1000 V	0.005 %				
	AC Voltage	(1 to 33) mV 50 Hz to 10 kHz > 10 kHz to 100 kHz	0.1 % 0.9 %				
		33mV to 1020 V 50 Hz to 100 kHz	0.1 %				
	AC Current	50 µA - 3.3 mA (45 Hz - 1 kHz)	0.2 %				
		> 3.3 mA - 3 A (45 Hz - 10 kHz)	0.1 %				
		(> 3 to 10) A (45 Hz - 1 kHz)	0.1 %				
		(> 10 – 150) A (45 Hz - 65 Hz)	0.6 % + 0.3 A				
		(>150 - 1000) A (45 Hz - 65 Hz)	0.6 % + 1 A				
	DC Current	10 µA – 330 mA	0.03 %				
		(> 0.33 - 3.3) A	0.05 %			Metromac WI-C51:2022	P
		(> 3.3 - 10) A	0.08 %			Metromac WI-C129:2021	P
		(> 10 - 150) A	0.5 % + 0.2 A				
(> 150 - 1000) A		0.5 % + 0.5 A					



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Electrical (Measure)	Resistance	1 $\Omega$ to 1 k $\Omega$	0.1 %	Metromac WI-C51:2022	P
		> 1 k $\Omega$ - 1 M $\Omega$	0.006 %		
		> 1 M $\Omega$ - 1 G $\Omega$	0.06 %		
	Insulation testers	1 M $\Omega$ - 2 G $\Omega$	0.3 %	Metromac WI-C128:2019	P
		Fixed Values 10 M $\Omega$ 100 M $\Omega$ 1 G $\Omega$ 10 G $\Omega$	0.5 %		
Electrical (Source)	Capacitance	0.9 nF to 90 mF	0.5 %	Metromac WI-C51:2022	P/S
	Frequency	5 Hz to 900 kHz	0.2 %		
	AC Voltage	10 mV – 1 kV	0.02 %		
	DC Voltage	(0 - 1) kV	0.02 %		
	Resistance	10 $\Omega$ – 1 G $\Omega$	0.1 %		
	AC / DC Current	100 $\mu$ A to 20 A	0.1 %	Metromac WI-C129:2021	P/S
	AC / DC Current	(> 20 – 1000) A	2 %		
	Temperature simulation	RTD (-200 to 800) $^{\circ}$ C	0.1 $^{\circ}$ C	Metromac WI-C51:2022	P/S
		Type K (-200 to 1370) $^{\circ}$ C	0.5 $^{\circ}$ C		
		Type J (-210 to 1200) $^{\circ}$ C	1 $^{\circ}$ C		
DC High Voltage	1 kV to 40 kV	0.5 %	Metromac WI-C162:2022	P	
AC High Voltage	1kV to 28 kV	3 %			
Dimensional	Outside Micrometers	(1 - 100) mm	2 $\mu$ m	Metromac WI-C53:2019	P
		(> 100 - 300) mm	20 $\mu$ m	Metromac WI-C126:2019	P
	Dial Gauges	(0 - 10) mm	3 $\mu$ m		
		(> 10 - 25) mm	12 $\mu$ m		
	Steel Ruler	(0 – 1000) mm	0.5 mm	P	
	Measuring Tape	0 – 50 m	(0.3 + 0.2 L) mm Where L in m	Metromac WI-C148:2020	P
	Vernier Calipers	(0 to 300) mm	30 $\mu$ m	Metromac WI-C08:2022	P
(300 to 600) mm		50 $\mu$ m			
Height Gauge	(0 - 600) mm	30 $\mu$ m	Metromac WI-C160:2022	P	



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Volume	Micropipettes	(10 - 100) µl	0.09 µl	Metromac WI-C82:2014	P
		(0.1 - 1) ml	0.39 µl		
		(1 - 10) ml	3.8 µl		
Weighing balance	Digital Weighing Balance	(0 - 21) g	0.09 mg	Metromac WI-C83:2017	S
		(> 21 - 220) g	0.24 mg		
		(> 0.220 - 1) kg	1.6 mg		
		(> 1 - 6.2) kg	0.03 g		
		(> 6.2 - 30) kg	0.64 g		
		(> 30 - 300) kg	18 g		
		(> 300 - 500) kg	71 g		
Mass	Standard Weights Class M	( 1 ) kg	20 mg	Metromac WI-C150:2022, based on OIML R 111-1:2004	P
		( 2 ) kg	30 mg		
		( 5 ) kg	80 mg		
		( 10 ) kg	160 mg		
		( 20 ) kg	300 mg		
Density	Density/Specific Gravity Meter	(0.6 to 2) g/cm <sup>3</sup>	0.0005 g/cm	Metromac WI-C143:2020	P/S
pH	pH Meter	4,7 & 10 pH	0.05 pH	Metromac WI-C159:2022	P/S
Flow	Air/Gas Flow meter	(0- 6) m <sup>3</sup> /h	0.5 %	Metromac WI-C102:2019	P
	Liquid Flow Meter	(0-10) m <sup>3</sup> /h	1.5 %		
Pressure	Hydraulic Pressure Gauges Pressure Transducer/ Transmitter	(0 - 60) bar	0.03 bar	Metromac WI-C50:2019	P / S
		(> 60 - 700) bar	0.2 bar		
		(> 700 - 1200) bar	0.4 bar		
		(> 1200 - 4000) bar	2 bar		
	Pneumatic Pressure Gauges Pressure Transducer/ Transmitter	(0 - 7) bar	0.003 bar	Metromac WI-C52:2019	P/S
		(> 7 - 70) bar	0.005 bar		
		(> 70 - 100) bar	0.01 bar		
Vacuum Gauges	(-0.8 to 0) bar	0.003 bar	Metromac WI-C72:2019	P/S	



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Temperature	IR Thermometer	(-30 to 50) °C	1°C	Metromac WI-C147:2019	P
		(> 50 to 200) °C	2°C		
		(> 200 to 500) °C	3°C		
	RTD/Thermometer Transmitter Thermo-couple with Indicator	(-40 to 100) °C	0.2 °C	Metromac WI-C68:2014	P / S
		(> 100 to 250) °C	0.3 °C		
		(> 250 to 420) °C	0.4 °C		
	Glass Thermometer	(-40 to 150) °C	0.2 °C	Metromac WI-C88:2016	P
	Dry Block Calibrator	(-40 to 150) °C	0.4°C	Metromac WI-C161:2022	P
		(150 to 600) °C	0.6°C		
	Temperature/Humidity Meter, Data Loggers	(5 to 50) °C	0.4°C	Metromac WI-C157:2022	P
(20 to 80) %Rh		1.2% Rh			
9 points measurement (Oven, Freezer, Chiller, Incubator)	(-30 to 250) °C	2 °C	Metromac WI-C81:2014	S	
5 points measurements (Water Bath)	(30 to 100) °C	2 °C	Metromac WI-C100:2016	S	
Force	Tension - Load Cell Tension - Force Gauge	(0 - 200) kN	2 %	Metromac WI-C69:2020	P
Torque	Torque Wrenches	(1.2 - 1500) Nm	1.5 %	Metromac WI-C127:2019	P
Rotational speed	Tachometer Non-contact	(60 - 100000) rpm	1 rpm + 0.015%	Metromac WI-C149:2020	P
	Tachometer Direct contact	(60 - 7000) rpm	2 rpm + 0.045%		
Time	Stop Watch	(0 - 24) h	0.5 s	Metromac WI-C138:2020	P
Noise & Sound	Sound Level Calibrator	(94 & 114) dB	0.4 dB	Metromac WI-C158:2022	P
	Sound Level meter	(94 & 114) dB	0.6 dB		
<b>END</b>					