



# Accreditation Scope

**Middle East Calibration Lab L.L.C, NAL 110**  
**Calibration Laboratory, (ISO/IEC 17025:2017)**

**Industrial Area-6, Sharjah, UAE**

Issue Date: 01-05-2023  
Issue No: 06

Expiry Date: 30-12-2025

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measurement Range	Expanded Measurement Uncertainty (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Mass	Non-Automatic Weighing Instruments / Scales	0.001 g	0.00002 g	Internal Procedure: MEM-WP-01: 2023	S
		0.002 g	0.00002 g		
		0.005 g	0.00002 g		
		0.01 g	0.00002 g		
		0.02 g	0.00003 g		
		0.05 g	0.00004 g		
		0.1 g	0.00005 g		
		0.2 g	0.00006 g		
		0.5 g	0.00008 g		
		1 g	0.00009 g		
		2 g	0.00012 g		
		5 g	0.00015 g		
		>5 to 10 g	0.00018 g		
		>10 to 20 g	0.00024 g		
		>20 to 50 g	0.0003 g		
		>50 to 100 g	0.00048 g		
		>100 to 200 g	0.0009 g		
		>200 to 500 g	0.0024 g		
		>500 to 1000 g	0.0048 g		
		1 kg	0.000015 kg		
		>1 to 2 kg	0.00003 kg		
		>2 to 4 kg	0.00006 kg		
		>4 to 5 kg	0.000075 kg		
		>5 to 10 kg	0.00015 kg		
		>10 to 20 kg	0.0003 kg		
		>20 to 40 kg	0.00066 kg		
		>40 to 100 kg	0.015 kg		
		>100 to 200 kg	0.03 kg		
		>200 to 500 kg	0.075 kg		
		>500 to 1000 kg	0.15 kg		
>1000 to 2000 kg	1 kg				
>2000 to 3000 kg	1.5 kg				
>3000 to 5000 kg	2.5 kg				
>5000 to 10000 kg	5 kg				



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Mass	Pallet Truck / Pallet Scale	0 to 500 kg	0.075 kg	Internal Procedure: MEM-WP-02: 2023	S
		>500 to 1000 kg	0.15 kg		
		>1000 to 2000 kg	0.9 kg		
		>2000 to 3000 kg	1.35 kg		
	Digital Hanging / Crane Scale	0 to 10 kg	0.00015 kg	Internal Procedure: MEM-WP-03: 2023	S
		>10 to 20 kg	0.0003 kg		
		>20 to 40 kg	0.00066 kg		
		>40 to 100 kg	0.015 kg		
		>100 to 200 kg	0.03 kg		
		>200 to 500 kg	0.075 kg		
		>500 to 1000 kg	0.15 kg		
		>1000 to 2000 kg	0.9 kg		
		>2000 to 3000 kg	1.35 kg		
	Tank Scale / Batching Plants	(0 to 40) kg	0.006 kg	Internal Procedure: MEM-WP-04: 2023	S
		(> 40 to 1000) kg	0.15 kg		
		(> 1000 to 2000) kg	0.9 kg		
		(> 2000 to 5000) kg	2.25 kg		
		(> 5000 to 10000) kg	4.5 kg		
	Conventional Mass F1 Class	200 mg	0.02 mg	Internal Procedure: MEM-WP-18A: 2023	P
		500 mg	0.02 mg		
		1 g	0.03 mg		
		2 g	0.04 mg		
		5 g	0.05 mg		
		10 g	0.06 mg		
		20 g	0.08 mg		
		50 g	0.10 mg		
		100 g	0.16 mg		
	200 g	0.30 mg			



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Mass	Conventional Mass F2 & Lower Class	(1 to 10) mg	0.02 mg	Internal Procedure: MEM-WP-18A: 2023	P
		20 mg	0.03 mg		
		50 mg	0.04 mg		
		100 mg	0.05 mg		
		200 mg	0.06 mg		
		500 mg	0.08 mg		
		1 g	0.10 mg		
		2 g	0.12 mg		
		5 g	0.16 mg		
		10 g	0.20 mg		
	20 g	0.25 mg			
	Conventional Mass F2 & Lower Class	50 g	0.30 mg	Internal Procedure: MEM-WP-18A: 2023	P
		100 g	0.50 mg		
		200 g	1.0 mg		
		500 g	10 mg		
Conventional Mass F2 & Lower Class	1 kg	10 mg	Internal Procedure: MEM-WP-10A: 2022	P	
	2 kg	30 mg			
	5 kg	80 mg			
	10 kg	0.1 g			
20 kg	0.3 g				
Light	Lux Meters	(20 to 50000) lux	1.6 % x I	Internal Procedure: MEM-WP-10A: 2022	P
Sound	Sound Level Meters	94 dB, 114 dB	0.4 dB	Internal Procedure: MEM-WP-11A: 2022	P
	Sound Level Calibrators	94 dB, 114 dB	0.4 dB		
Gas Flow	Rotameters / Air Flow Meters	0 to 30 L/min	0.42% x I	Internal Procedure: MEM-WP-12A: 2022	P/S
Air Velocity	Anemometers / Air Velocity Meters	(0 to 0.6) m/s	0.2 m/s	Internal Procedure: MEM-WP-13A: 2023	P
		(>0.6 to 6) m/s	0.6 m/s		
		(>6 to 10) m/s	1.2 m/s		
		(10 to 15) m/s	1.8 m/s		
		(15 to 20) m/s	2.3 m/s		



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Time	Timers / Stop Watches	0 to 30 min	0.6 s	Internal Procedure: MEM-WP-14A: 2022	P
		>30 min to 24 h)	1.1 s		
Speed	rpm Meters/ speed Indicators (Contact mode)	0 to 10 rpm	0.92 rpm	Internal Procedure: MEM-WP-15A: 2022	P
		>10 to 1000 rpm	2.0 rpm		
		>1000 to 10000 rpm	7.4 rpm		
	rpm Meters/ speed Indicators (Non-Contact mode)	0 to 10 rpm	0.92 rpm	Internal Procedure: MEM-WP-15A: 2022	P
		>10 to 1000 rpm	2.0 rpm		
		>1000 to 10000 rpm	7.4 rpm		
		>10000 to 30000 rpm	21 rpm		
	rpm Meters/ Speed Indicators (Source) (Non-Contact Mode)	0 to 5000 rpm	4.5 rpm	Internal Procedure: MEM-WP-15A: 2022	P
		>5000 to 25000 rpm	9.5 rpm		
		25000 to 100000 rpm	14.5 rpm		
	rpm Meters/ Speed Indicators (Source) (Contact Mode)	0 to 1001 rpm	2.3 rpm	Internal Procedure: MEM-WP-15A: 2022	P
		>1001 to 10000 rpm	9.7 rpm		
pH	pH Meter	(4, 7, 10) pH	0.03 pH	Internal Procedure: MEM-WP-19A: 2022	P
Electrical Conductivity (EC)	Conductivity Meter	( 0 to 200) mS/cm	5.1 x 10 <sup>-3</sup> x C	Internal Procedure: MEM-WP-19B: 2022	P
Total Dissolved Solids (TDS)	TDS Meter	(0 to 99.9) *10 <sup>-12</sup>	3.4 x 10 <sup>-3</sup> x TDS	Internal Procedure: MEM-WP-19B: 2022	P
Dimensional	Surface Plate	up to (2.4 x 1.6) m	4 µm	Internal Procedure: MEM-WP-06: 2022	S
	Vernier / Digital Caliper / Caliper Gauges	(0 to 300) mm	0.02 mm	Internal Procedure: MEM-WP-09B: 2022	P
		(> 300 to 600) mm	0.05 mm		
	Vernier / Digital Caliper	(> 0.6 to 1) m	0.08 mm		
		(> 1 to 1.5) m	0.1 mm		
(> 1.5 to 2.1) m		0.15 mm			



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Dimensional	Outside Micrometers / (Analog & Digital)	(0 to 200) mm	2 µm	Internal Procedure: MEM-WP-09A: 2023	P
		(> 200 to 300) mm	3 µm		
		(> 300 to 600) mm	5 µm		
		(> 0.6 to 1) m	8 µm		
		(> 1 to 1.5) m	16 µm		
	Height Gauges	(> 1.5 to 2.1) m	19 µm	Internal Procedure: MEM-WP-09J: 2022	P
		(0 to 300) mm	3 µm		
		(> 300 to 600) mm	6 µm		
		(> 0.6 to 1) m	8 µm		
		(> 1 to 1.5) m	16 µm		
	Feeler Gauges	(> 1.5 to 2.1) m	20 µm	Internal Procedure: MEM-WP-09D: 2022	P
		(0 to 2) mm	4 µm		
	Protractor / Combination Square set / Angle Gauges	(0 to 90°)	0.01°	Internal Procedure: MEM-WP-09F: 2022	P
		> 90° to 180°	0.02°		
		> 180° to 360°	0.03°		
	Setting rods	(0 to 300) mm	3 µm	Internal Procedure: MEM-WP-09K: 2022	P
		(>300 to 600) mm	6 µm		
		(>0.6 to 1) m	8 µm		
	Dial & Digital Indicators / LVDT	(0 to 10) mm	4 µm	Internal Procedure: MEM-WP-09C: 2022	P
		(>10 to 50) mm	4 µm		
(>50 to 100) mm		5 µm			
Thickness Gauges & Coating thickness gauge	(0 to 25) mm	3 µm	Internal Procedure: MEM-WP-09E: 2022	P	
	(0 to 300) mm	3 µm			
Depth Gauges / Depth Micrometers	(>300 to 600) mm	6 µm	Internal Procedure: MEM-WP-09M: 2022	P	
	(>0.6 to 1) m	8 µm			
	(>1 to 1.5) m	16 µm			
	(0 to 2000) mm	0.3 mm			
Steel Ruler			Internal Procedure: MEM-WP-09I: 2022	P	



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Dimensional	Measuring Tape	(0 to 2.1) m	0.3 mm	Internal Procedure: MEM-WP-09H: 2022	P
		(>2.1 to 4) m	0.6 mm		
		(>4 to 6.1) m	0.9 mm		
		(>6.1 to 8) m	1.2 mm		
		(>8 to 10.1) m	1.5 mm		
		(>10.1 to 12) m	1.8 mm		
		(>12 to 14.1) m	2.1 mm		
		(>14.1 to 16) m	2.4 mm		
		(>16 to 18.1) m	2.7 mm		
		(>18.1 to 20) m	3.0 mm		
		(>20 to 22.1) m	3.3 mm		
		(>22.1 to 24) m	3.6 mm		
		(>24 to 26.1) m	3.9 mm		
		(>26.1 to 28) m	4.2 mm		
	(>28 to 30.1) m	4.5 mm			
	(>30.1 to 100) m	(4.5 + 0.15*L) mm (L=Length in meter)			
	Bore Gauges (Two Point)	(0 to 50) mm	5 µm	Internal Procedure: MEM-WP-06B: 2022	P
	Profile projector and Microscope	- Length and width: (0 to 300) mm - Angle: 0° to 360° - Magnification (by calculation)	length: 4 µm Angle: 0.03 ° Magnification: 0.15%	Internal Procedure: MEM-WP-09V: 2022	P / S
	Pin Gauge, Plain Plug gauge, thickness standards	(0 to 25) mm	0.002 mm	Internal Procedure: MEM-WP-09W: 2022	P / S
		(>25 to 150) mm	0.004 mm		



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Dimensional	Measurement using profile projector: - Length - Angle - Radius - Straightness - Thread Pitch - Profile Gauges - Aperture size of test sieve	300 mm	length: 4 µm Angle: 0.03 °	Internal Procedure: MEM-WP-09X: 2022	P / S
	Straightness	(0 to 900) mm	0.006 mm	Internal Procedure: MEM-WP-09X: 2022	P / S
	Measurements of Length, Thickness, Diameter/Radius, Depth	(0 to 200) m	0.004 mm	Internal Procedure: MEM-WP-20D: 2022	P / S
		(>200 to 300) m	0.05 mm	Internal Procedure: MEM-WP-20D: 2022	
		(>200 to 600) m	0.08 mm	Internal Procedure: MEM-WP-20D: 2022	
		(>600 to 1000) m	0.5 mm	Internal Procedure: MEM-WP-20D: 2022	
	Durometers	(10 to 50) Hardness Shore A & D	1 Shore Hardness	Internal Procedure: MEM-WP-21A: 2023	P / S
(>50 to 90) Hardness Shore A & D		1.5 Shore Hardness			
Temperature	Digital & Dial Thermometer / Temperature sensor with indicator	(-30 to 70) °C	0.3 °C	Internal Procedure: MEM-WP-05A: 2022	P/S
		(50 to 200) °C	0.4 °C		
		(200 to 400) °C	0.63 °C		
	Fridge/Freezer thermometers / Temp. Data loggers / Max Min Thermometer	(-30 to 70) °C	0.3 °C	Internal Procedure: MEM-WP-05A: 2022	P



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Temperature	Oven, Incubator, Chiller, Freezer, etc	(-20 to 50) °C	0.49 °C	Internal Procedure: MEM-WP-05B: 2022	P/S
		(> 50 to 150) °C	0.6 °C		
		(> 150 to 250) °C	0.97 °C		
	Water Bath / Oil Bath	(-20 to 50) °C	0.15 °C	Internal Procedure: MEM-WP-05B: 2022	P/S
		(> 50 to 150) °C	0.41 °C		
		(> 150 to 250) °C	0.67 °C		
	Autoclave	(30 to 140) °C	0.12 °C	Internal Procedure: MEM-WP-05B: 2022	P/S
	Temperature Chart Recorder	(-30 to 100) °C	0.4 °C	Internal Procedure: MEM-WP-05A:2022	P/S
	Furnace	(0 to 100) °C	0.6 °C	Internal Procedure: MEM-WP-05D:2022	P/S
(>100 to 800) °C		2.9 °C			
(>800 to 1100) °C		4.7 °C			
Humidity	Humidity Chambers (Single point)	(20 to 90) %RH	2 %RH	Internal Procedure: MEM-WP-05B:2022	P/S
	Hygrometers	(20 to 90) %RH	3 %RH	Internal Procedure: MEM-WP-05C:2022	P
Pressure	Pressure Gauges / Differential pressure gauges / Switches / Pressure Chart Recorders	(0 to 4) bar	4 mbar	Internal Procedure: MEM-WP-07A:2022	P/S
		(> 1 to 12) bar	40 mbar		
		(> 12 to 40) bar	0.1 bar		
		(> 40 to 300) bar	0.2 bar		
		(> 300 to 800) bar	0.4 bar		
		(> 800 to 1000) bar	0.6 bar		
	(> 1000 to 2500) bar	3.4 bar			
Vacuum Gauges	(-0.9 to 0) bar	5 mbar	Internal Procedure: MEM-WP-07A:2022	P/S	





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Volume	Piston-operated volumetric apparatus (Pipettes, Dispensers)	(10 ≤ V ≤ 100) µl	0.28 µl	Internal Procedure: MEM-WP- 17A: 2022	P
		(100 ≤ V ≤ 200) µl	0.47 µl		
		(200 ≤ V ≤ 1000) µl	0.57 µl		
		(1000 ≤ V ≤ 2000) µl	0.73 µl		
		(2 ≤ V ≤ 5) ml	1.6 µl		
	Volumetric Apparatus One mark / Graduated Pipettes, Buretes)	(5 ≤ V ≤ 10) ml	2.1 µl	Internal Procedure: MEM-WP- 17B: 2022	P
		(500 ≤ V ≤ 2000) µl	0.033 ml		
		(2 ≤ V ≤ 10) ml	0.038 ml		
		(10 ≤ V ≤ 50) ml	0.07 ml		
	Volumetric Apparatus One mark-Cylinder, Beaker, Flask	(50 ≤ V ≤ 150) ml	0.18 ml	Internal Procedure: MEM-WP- 17B: 2022	P
		(10 ≤ V ≤ 200) ml	0.3 % × l		
	Volumetric Apparatus Graduated Cylinder, Beaker, Flask	(200 ≤ V ≤ 5000) ml	0.2% × l	Internal Procedure: MEM-WP- 17B: 2022	P
		(10 ≤ V ≤ 100) ml	0.3 % × l		
	Specific Gravity / Density Containers / Volumetric Prover Tanks	(100 ≤ V ≤ 5000) ml	0.2 % × l	Internal Procedure: MEM-WP- 17B: 2022	P
		(10 ≤ V ≤ 100) ml	0.3 % × l		
(5 ≤ V ≤ 20) l		0.2 % × l			
Volumetric Prover Tanks					



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Force	Compression Machine / UTM Machine (Compression Mode)	200 kN to 3 MN	0.5 % x I	Internal Procedure: MEM-WP-16A: 2022	S
	Force Gauges Tensile load cell With Indicator	( 0 to 1) kN	0.10%	Internal Procedure: MEM-WP-16B: 2022	P
Electrical	High Voltage (AC, 50Hz) (Source)	(0 to 1) kV	0.002 kV	Internal Procedure: MEM-WP-08C: 2022	P/S
		(>1 to 10) kV	0.2 kV		
		(>10 to 20) kV	0.4 kV		
		(>20 to 50) kV	1 kV		
		(>50 to 80) kV	2.0 kV		
		(>80 to 100) kV	2.5 kV		
	High Voltage (DC source)	(0 to 1 ) kV	0.001 kV	Internal Procedure: MEM-WP-08C: 2022	P/S
		(>1 to 10 ) kV	0.2 kV		
		(10 to 20) kV	0.4 kV		
		(>20 to 50) kV	1 kV		
		(>50 to 80) kV	2.0 kV		
		(>80 to 100) kV	2.5 kV		
	AC Voltage, 45Hz to 10 kHz (Measurement)	(1 to 32.999) mV	0.12 mV	Internal Procedure: MEM-WP-08A: 2023	P/S
		(33 to 329.999) mV	0.28 mV		
		(0.33 to 3.29999) V	2.4 mV		
		(3.3 to 32.9999) V	24 mV		
(33 to 329.999) V		0.4 V			
(330 to 1020) V		1.22 V			
DC Voltage, (Measurement)	(0 to 330) mV	53 µV	Internal Procedure: MEM-WP-08A: 2023	P/S	
	(>0.33 to 3.3) V	2.3 mV			
	(>3.3 to 33) V	4.6 mV			
	(>33 to 330) V	43 mV			
	(>330 to 1020) V	133 mV			



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Electrical	AC Current, 45Hz to 1 kHz (Measurement)	(29 to 329.999) $\mu$ A	1.23 $\mu$ A	Internal Procedure: MEM-WP-08A: 2023	P/S
		(0.33 to 3.29999) mA	9 $\mu$ A		
		(3.3 to 32.9999) mA	0.05 mA		
		(33 to 329.999) mA	0.6 mA		
		(0.33 to 1.09999) A	2.2 mA		
	AC Current, 45Hz to 100 Hz (Measurement)	(1.1 to 2.99999) A	7.1 mA	Internal Procedure: MEM-WP-08A: 2023	P/S
		(3 to 10.9999) A	0.03 A		
	AC Current (Clamp) 45Hz to 65 Hz (Measurement)	(11 to 20.5) A	0.07 A	Internal Procedure: MEM-WP-08A: 2023	P/S
		(10 to 16.499) A	0.08 A		
		(16.5 to 149.99) A	0.8 A		
		(150 to 300) A	2.0 A		
	AC Current, 65Hz to 440 Hz (Measurement)	(300 to 600) A	3.4 A	Internal Procedure: MEM-WP-08A: 2023	P/S
		(600 to 1025) A	5.4 A		
		(10 to 16.499) A	0.2 A		
		(16.5 to 149.99) A	1.9 A		
	DC Current, (Measurement)	(150 to 300) A	8.1 A	Internal Procedure: MEM-WP-08A: 2023	P/S
		(300 to 600) A	16.0 A		
		(600 to 1025) A	26.0 A		
		(0 to 329.999) $\mu$ A	0.16 $\mu$ A		
		(0.3 to 3.29999) mA	0.9 $\mu$ A		
(3.3 to 32.9999) mA		8.5 $\mu$ A			
(33 to 329.999) mA		0.12 mA			
(0.33 to 1.09999) A		1.1 mA			
(1.1 to 2.99999) A		3.2 mA			
(3 to 20) A		30 mA			
(10 to 16.499) A		0.068 A			
(16.5 to 149.99) A	0.62 A				
(150 to 300) A	1.3 A				
(300 to 600) A	2.5 A				
(600 to 1025) A	4.3 A				



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Electrical	Resistance (Measurement)	(0 to 10.999) $\Omega$	0.026 $\Omega$	Internal Procedure: MEM-WP-08A: 2023	P/S
		(11 to 32.999) $\Omega$	0.044 $\Omega$		
		(33 to 109.99) $\Omega$	0.058 $\Omega$		
		(110 to 329.999) $\Omega$	0.115 $\Omega$		
		(0.33 to 1.09999) k $\Omega$	0.3 $\Omega$		
		(1.1 to 3.29999) k $\Omega$	1.1 $\Omega$		
		(3.3 to 10.9999) k $\Omega$	2.5 $\Omega$		
		(11 to 32.9999) k $\Omega$	9.2 $\Omega$		
		(33 to 109.999) k $\Omega$	30 $\Omega$		
		(110 to 329.999) k $\Omega$	110 $\Omega$		
		(0.33 to 1.09999) M $\Omega$	400 $\Omega$		
		(1.1 to 3.29999) M $\Omega$	1500 $\Omega$		
		(3.3 to 10.9999) M $\Omega$	15 k $\Omega$		
		(11 to 32.9999) M $\Omega$	0.08 M $\Omega$		
	(33 to 109.999) M $\Omega$	1.3 M $\Omega$			
	(110 to 329.999) M $\Omega$	4.3 M $\Omega$			
	(330 to 1100) M $\Omega$	40 M $\Omega$			
	Capacitance (Measurement)	(220 to 399.9) pF	28 pF	Internal Procedure: MEM-WP-08A: 2023	P/S
		(0.4 to 1.0999) nF	0.036 nF		
		(1.1 to 3.2999) nF	0.062 nF		
		(3.3 to 10.999) nF	0.087 nF		
		(11 to 32.999) nF	0.42 nF		
		(33 to 109.99) nF	0.87 nF		
		(110 to 329.99) nF	2.6 nF		
(0.33 to 1.0999) $\mu$ F		8.7 nF			
(1.1 to 3.2999) $\mu$ F		0.027 $\mu$ F			
(3.3 to 10.999) $\mu$ F		0.087 $\mu$ F			



# Accreditation Scope

**Middle East Calibration Lab L.L.C, NAL 110**  
**Calibration Laboratory, (ISO/IEC 17025:2017)**

**Industrial Area-6, Sharjah, UAE**

**Issue Date: 01-05-2023**  
**Issue No: 06**

**Expiry Date: 30-12-2025**

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measurement Range	Expanded Measurement Uncertainty (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical	Capacitance (Measurement)	11 to 32.999 $\mu$ F	0.38 $\mu$ F	Internal Procedure: MEM-WP-08A: 2023	P/S
		33 to 109.99 $\mu$ F	1.4 $\mu$ F		
		110 to 329.99 $\mu$ F	4.2 $\mu$ F		
		0.33 to 1.0999 mF	14 $\mu$ F		
		1.1 to 3.2999 mF	0.04 mF		
		3.3 to 10.999 mF	0.14 mF		
		11 to 32.999 mF	0.64 mF		
	Frequency (Measurement)	(0.01 to 100) Hz	11 mHz	Internal Procedure: MEM-WP-08A: 2023	P/S
		(100 to 500) Hz	73 mHz		
		(500 to 1000) Hz	0.1 Hz		
		(1 to 10) kHz	0.8 Hz		
		(10 to 100) kHz	8.4 Hz		
	DC Power (Measurement)	up to 20000 Watts	0.16 % x I	Internal Procedure: MEM-WP-08A: 2023	P/S
	AC Power 500 Hz to 1 kHz, Phase angle $\phi = 0$ . (Measurement)	up to 10000 Watts	0.3 % x I		
		>10000 to 20000 Watts	0.4 % x I		
	AC Voltage, 10Hz to 20 kHz (Source)	(0 to 100) mV	0.14 mV	Internal Procedure: MEM-WP-08A: 2023	P/S
		> 100 mV to 1 V	0.035 V		
		> 1 V to 10 V	0.042 V		
		> 10 V to 100 V	0.13 V		
	DC Voltage, (Source)	> 100 V to 1000 V	0.77 V	Internal Procedure: MEM-WP-08A: 2023	P/S
(0 to 100) mV		9 $\mu$ V			
> 100 mV to 1 V		0.8 mV			
> 1 V to 10 V		0.9 mV			
> 10 V to 100 V		5.3 mV			
> 100 V to 1000 V	0.05 V				



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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measurement Range	Expanded Measurement Uncertainty (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical	AC Current, 10Hz to 5 kHz (Source)	(0 to 100) $\mu$ A	0.25 $\mu$ A	Internal Procedure: MEM-WP-08A: 2023	P/S
		> 100 $\mu$ A to 1mA	47 $\mu$ A		
		> 1 mA to 10 mA	58 $\mu$ A		
		> 10 mA to 100 mA	0.18 mA		
		> 100 mA to 1 A	47 mA		
		> 1 A to 3 A	75 mA		
		> 3 A to 10 A	87 mA		
	DC Current, (Source)	(0 to 100) $\mu$ A	0.088 $\mu$ A	Internal Procedure: MEM-WP-08A: 2023	P/S
		> 100 $\mu$ A to 1mA	6.4 $\mu$ A		
		> 1 mA to 10 mA	29 $\mu$ A		
		> 10 mA to 100 mA	64 $\mu$ A		
		> 100 mA to 1 A	24 mA		
	Resistance (Source)	> 1 A to 10 A	27 mA	Internal Procedure: MEM-WP-08A: 2023	P/S
		(0 to 10) $\Omega$	36 m $\Omega$		
		> 10 $\Omega$ to 100 $\Omega$	16 m $\Omega$		
		> 100 $\Omega$ to 1 k $\Omega$	1.3 $\Omega$		
		> 1 k $\Omega$ to 10 k $\Omega$	2.3 $\Omega$		
		> 10 k $\Omega$ to 100 k $\Omega$	12.7 $\Omega$		
		> 100 k $\Omega$ to 1 M $\Omega$	1.3 k $\Omega$		
		> 1 M $\Omega$ to 10 M $\Omega$	6.6 k $\Omega$		
	Capacitance (Source)	> 10 M $\Omega$ to 100 M $\Omega$	0.96 M $\Omega$	Internal Procedure: MEM-WP-08A: 2023	P/S
		> 100 M $\Omega$ to 1 G $\Omega$	37 M $\Omega$		
		(0 to 1) nF	2.9 nF		
		> 1 nF to 10 nF	0.7 nF		
		> 10 nF to 100 nF	1.8 nF		
		> 100 nF to 1 $\mu$ F	0.6 $\mu$ F		
		> 1 $\mu$ F to 10 $\mu$ F	0.7 $\mu$ F		
		> 10 $\mu$ F to 100 $\mu$ F	1.9 $\mu$ F		
		> 100 $\mu$ F to 1 mF	0.6 $\mu$ F		
	> 1 mF to 10 mF	0.7 $\mu$ F			
	> 10 mF to 100 mF	4.9 $\mu$ F			



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**Expiry Date: 30-12-2025**

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measurement Range	Expanded Measurement Uncertainty (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical	Frequency (Source)	(3 to 10) Hz	58 mHz	Calibration Methods: In house Procedures MEM-WP- 08C:2019	P/S
		> 10 Hz to 19.9 Hz	69 mHz		
		> 20 Hz to 40 Hz	14 mHz		
		> 40 Hz to 200 Hz	23 mHz		
		> 200 Hz to 999.99 Hz	0.12 Hz		
		> 1 kHz to 2 kHz	0.23 Hz		
		> 2 kHz to 20 kHz	2.3 Hz		
		> 20 kHz to 200 kHz	23 Hz		
		>200 kHz to 300 kHz	35 Hz		
		>300 kHz to 1 MHz	120 Hz		
	Thermocouple J Type (Measure & Source)	-210 to 0°C	0.7°C	Internal Procedure: MEM-WP- 08A: 2023	P/S
		0 to 150°C	0.4 °C		
		150 to 760°C	0.5 °C		
		760 to 1200°C	0.6 °C		
	Thermocouple k Type (Measure & Source)	-200 to 1000°C	0.6 °C	Internal Procedure: MEM-WP- 08A: 2023	P/S
		1000 to 1372°C	1 °C		
	Thermocouple N Type (Measure & Source)	-200 to -20°C	1 °C	Internal Procedure: MEM-WP- 08A: 2023	P/S
		-20 to 410°C	0.5 °C		
		410 to 1300°C	0.7 °C		



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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measurement Range	Expanded Measurement Uncertainty (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical	Thermocouple R Type (Measure & Source)	0 to 1767°C	1.3 °C	Internal Procedure: MEM-WP-08A: 2023	P/S
	Thermocouple S Type (Measure & Source)	0 to 1767°C	1.1 °C	Internal Procedure: MEM-WP-08A: 2023	P/S
	Thermocouple T Type (Measure & Source)	-250 to -150°C	1.5 °C	Internal Procedure: MEM-WP-08A: 2023	P/S
		-150 to 0°C	0.6 °C		
		0 to 120°C	0.4 °C		
	RTD (Measure)	120 to 400°C	0.4 °C	Internal Procedure: MEM-WP-08A: 2023	P/S
		-200 to 400°C	0.2 °C		
	RTD (Source)	400 to 660°C	0.5 °C	Internal Procedure: MEM-WP-08A: 2023	P/S
		-200 to 300°C	0.1 °C		
		300 to 400°C	0.2 °C		
		400 to 630°C	0.2 °C		
		630 to 800°C	0.3 °C		
END					