



Accreditation Scope

CALTROLS Middle East LLC, NAL 151
Calibration Laboratory, (ISO/IEC 17025:2017)

M33 – Mussafah, Abu Dhabi, UAE

Issue Date: 30-01-2023
Issue No: 02

Expiry Date: 23-01-2024

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical (Source)	DC Voltage	(0 to 330) mV	12 μ V	CME/CP/E/01	P
		(>0.33 to 3.3) V	62 μ V		
		(>3.3 to 33) V	0.4 mV		
		(>33 to 330) V	7.7 mV		
		(330 to 1000) V	0.6 V		
	AC Voltage @ 10 Hz	(1.0 to 33) mV	32 μ V		
		(>33 to 330) mV	0.1 mV		
		(0.33 to 3) V	0.9 mV		
	AC Voltage @ 1 kHz	(3.3 to 33) V	5.0 mV		
		(>33 to 330) V	57 mV		
		(330 to 1020) V	0.3 V		
	AC Voltage @ 45 Hz	(1.0 to 33) mV	30 μ V		
		(>33 to 330) mV	91 μ V		
		(>0.33 to 3) V	0.8 mV		
		(>3.3 to 33) V	8.9 mV		
		(>33 to 330) V	59 mV		
		(330 to 1020) V	0.3 V		
	DC Current	(0 to 330) μ A	0.1 μ A		
(>0.33 to 3.3) mA		0.6 μ A			



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Electrical (Source)	DC Current	(>3.3 to 33) mA	5.6 μ A	CME/CP/E/01	P
		(>33 to 330) mA	56 μ A		
		(>0.33 to 1.1) A	0.4 mA		
		(>1.1 to 3) A	1 mA		
		(>3 to 10) A	8.6 mA		
		(>10 to 20.5) A	58 mA		
		(20.5 to 1000) A	0.15 A		
	AC Current @ 10 Hz	(29 to 330) μ A	1.2 μ A		
		(>0.33 to 3.3) mA	11 μ A		
		(>3 to 33) mA	96 μ A		
		(>33 to 330) mA	1.0 mA		
		(>0.33 to 1.1) A	3.3 mA		
	AC Current @ 1 kHz	(1.1 to 3) A	3.1 mA		
		(>3 to 11) A	21 mA		
		(>11 to 20.5) A	59 mA		
		(20.5 to 1000) A	0.5 A		
	AC Current @ 45 Hz	(29 to 330) μ A	0.9 μ A		
		(>0.33 to 3.3) mA	6.7 μ A		
		(>3.3 to 33) mA	50 μ A		
		(>33 to 330) mA	0.5 mA		
		(>0.33 to 1.1) A	3.2 mA		
		(>1.1 to 3) A	8.6 mA		
		(>3 to 11) A	21 mA		
		(>11 to 20.5) A	0.5 A		
		(20.5 to 1000) A	1.0 A		
	Resistance	(0 to 11) Ω	35 m Ω		
		(>11 to 33) Ω	35 m Ω		
(>33 to 110) Ω		35 m Ω			



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Electrical (Source)	Resistance	(>110 to 330) Ω	35 mΩ	CME/CP/E/01	P
		(>0.33 to 1.1) kΩ	60 mΩ		
		(>1.1 to 3.3) kΩ	68 mΩ		
		(>3.3 to 11) kΩ	0.5 Ω		
		(>11 to 33) kΩ	0.6 Ω		
		(>33 to 110) kΩ	4.9 Ω		
		(>110 to 330) kΩ	17 Ω		
		(>0.33 to 1.1) MΩ	57 Ω		
		(>1.1 to 3.3) MΩ	0.3 kΩ		
		(>3.3 to 11) MΩ	2.2 kΩ		
		(>11 to 33) MΩ	13 kΩ		
		(>33 to 110) MΩ	88 kΩ		
	(>110 to 330) MΩ	0.8 MΩ			
	Capacitance	(0.19 to 0.4) nF	19 pF		
		(> 1 to 1.1) nF	31 pF		
		(> 1.1 to 3.3) nF	45 pF		
		(> 3.3 to 11) nF	98 pF		
		(> 11 to 33) nF	0.3 nF		
		(> 33 to 110) nF	0.9 nF		
		(> 110 to 330) nF	1.9 nF		
		(> 0.33 to 1.1) μF	13 nF		
		(> 1.1 to 3.3) μF	19 nF		
		(> 3.3 to 11) μF	93 nF		
(> 11 to 33) μF		0.3 μF			
(33 to 110) μF	1.1 μF				



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Electrical (Source)	Frequency	(0.01 to 120) Hz	0.7 mHz	CME/CP/E/01	P
		(> 120 to 1200)Hz	7 mHz		
		(> 1.2 to 12) kHz	71 mHz		
		(> 12 to 120) kHz	0.7 Hz		
		(120 to 1200) kHz	0.6 kHz		
Electrical (Measure)	DC Voltage	(0.1 to 1) V	60 μV	CME/CP/E/02	P
		(> 1 to 10) V	0.6 mV		
		(> 10 to 100) V	9.0 mV		
		(> 0.1 to 1) kV	0.1 V		
	AC Voltage @ 10 Hz	(0.1 to 1) V	7.6 mV		
		(> 1 to 10) V	7.6 mV		
		(> 10 to 100) V	1.8 mV		
		(> 100 to 1000) V	1.7 V		
	AC Voltage @ 45 Hz	(0.1 to 1) V	3.3 mV		
		(> 1 to 10) V	18 mV		
		(> 10 to 100) V	0.34 V		
		(> 100 to 1000) V	1.7 V		
	DC Current	(0.1 to 400) mA	0.4 mA		
		(> 0.4 to 1) A	1.4 mA		
		(> 1 to 10) A	17 mA		
	AC Current @ 10 Hz	(0.1 to 100) mA	0.64 mA		
		(> 100 to 329) mA	2.0 mA		
		(> 0.329 to 1) A	5.3 mA		
		(> 1 to 10) A	64 mA		



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Electrical (Measure)	AC Current @ 45 Hz	(0.1 to 100) mA	0.22 mA	CME/CP/E/02	P
		(> 100 to 329) mA	1 mA		
		(> 0.329 to 1) A	1.2 mA		
		(> 1 to 10) A	33 mA		
	Resistance	(0.01 to 100) kΩ	22 Ω		
		(> 0.1 to 1) MΩ	0.22 kΩ		
		(> 1 to 10) MΩ	8.2 kΩ		
		(> 10 to 100) MΩ	1.6 MΩ		
	Capacitance	(1 to 100) nF	3 nF		
		(> 0.1 to 1) μF	30 nF		
		(> 1 to 100) μF	3 μF		
		(> 0.1 to 1) mF	30 μF		
		(> 1 to 100) mF	9 mF		
	Frequency	(0.1 to 1) kHz	60 Hz		
		(> 1 to 10) kHz	60 Hz		
		(> 10 to 100) kHz	60 Hz		
(> 0.1 to 1) MHz		48 Hz			
Electrical - Temperature Simulation (Source, Measure)	RTD	(-200 to 800) °C	0.23 °C	CME/CP/E/03	P
	K-Type	(-200 to 1370) °C	0.46 °C		
	J-Type	(-210 to 1200) °C	0.31 °C		



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Electrical Temperature Simulation (Source, Measure)	R-Type	(-5 to 1760) °C	0.46 °C	CME/CP/E/03	P
	S-Type	(0 to 1760) °C	0.66 °C		
	T - Type	(-260 to 400) °C	0.73 °C		
	N-Type	(-200 to 1300) °C	0.46 °C		
Temperature	<ul style="list-style-type: none"> • Thermometers • Thermocouple • Temperature gauges, Dial Thermometer and recorders • Dry block calibrator • Liquid Bath (1 point) 	(-20 to 100) °C	0.45 °C	For Thermometers: CME/CP/T/03 For thermocouple: CME/CP/T/02 For Temperature Gauges & Dial thermometers: CME/CP/T/05 For Dry block calibrator CME/CP/T/01 For liquid bath: CME/CP/T/08 For temperature chart records: CME/CP/T/07	P/S
		(> 100 to 400) °C	1.3 °C		
		(> 400 to 600) °C	1.8 °C		
	Liquid in Glass Thermometer	50 to 200) °C	1.3 °C	CME/CP/T/04	P
Vacuum Pressure	Pressure Gauge Pressure Transducer, Pressure Transmitter, Pressure Chart Recorder	(-0.90 to 0) bar	1 mbar	CME/CP/P/01 & 02	P/S
Pneumatic Pressure		(0 to 20) bar	5 mbar		
Hydraulic Pressure		(0 to 200) bar	20 mbar		
		(> 200 to 700) bar	60 mbar		
		(>700 to 1000) bar	0.1 bar		
	(1000 to 1400) bar	0.18 bar			



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Mass	Electronic Balance / Weighing Scale	(0 to 220) g	0.8 mg	CME/CP/M/01	P/S
		(0 to 1000) g	6 mg		
		(0 to 6100) g	9 mg		
		(0 to 20) kg	60 mg		
END					